Alaska Department of Environmental Conservation

Amendments to:

State Air Quality Control Plan

Vol. III: Appendices (to Vol.II, Section III.A and Section III.C)

Adopted
April 4, 2008

Volume III, Appendices, of the State Air Quality Control Plan is amended to include additional documents based on amendments to Volume II, Section III.A and Section III.C of that plan.

In particular, Appendix III.A.2 is amended by removing the document listed below:

- 18 AAC 52, EMISSIONS INSPECTION AND MAINTENANCE REQUIREMENTS FOR MOTOR VEHICLES EFFECTIVE, February 18, 2006

and replacing it with the following document:

- 18 AAC 52, EMISSIONS INSPECTION AND MAINTENANCE REQUIREMENTS FOR MOTOR VEHICLES, Adopted April 4, 2008

Appendix III.C.3 is amended by removing the documents listed below:

- Fairbanks 2002-2015 Carbon Monoxide Emission Inventory, February 2004

Appendix III.C.3 is amended by adding the documents listed below:

- Fairbanks 2005-2015 Carbon Monoxide Emission Inventory, October 2005
- October 25,2007 Memorandum: “Summary of Inventory Revisions to the 2004 Fairbanks CO Maintenance Plan”
- October 25, 2007 Memorandum: “Fairbanks Carbon Monoxide Maintenance Plan Emission Inventory Control Measure Adjustments”

Appendix III.C.6 is amended by adding the documents listed below:

- January 27, 2004 Memorandum: “Selection of CO Design Values for Fairbanks Maintenance Plan”

Appendix III.C.10 is amended by adding the documents listed below:

- User’s Guide to AKMOBILE6, October 23, 2007
- Affidavit of Oral Hearing
- Alaska Department of Environmental Conservation Response to Oral and Written Comments on the Fairbanks Carbon Monoxide Maintenance Plan
- Fairbanks North Star Borough Assembly resolution approving this plan revision

Alaska Department of Environmental Conservation

Amendments to:

State Air Quality Control Plan

Vol. III: Appendices

Appendix III.A.2

Adopted
April 4, 2008

18 AAC 52
EMISSIONS INSPECTION AND MAINTENANCE REQUIREMENTS FOR MOTOR VEHICLES
As Adopted April 4, 2008

DEPARTMENT OF

ENVIRONMENTAL CONSERVATION

18 AAC 52

Emissions Inspection and Maintenance Requirements for Motor Vehicles

IMPORTANT NOTE TO READER

The regulations in this booklet have been prepared by the Department of Environmental Conservation. They do not constitute an official version of these regulations, nor do they necessarily reflect current law. Any amendments made after the date of this booklet would appear in the published version of the Alaska Administrative Code. If any discrepancy is found between this booklet and the Alaska Administrative Code, the Code should be considered the final Authority, unless the discrepancy is the result of a manifest error in the Code.

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CHAPTER 52. EMISSIONS INSPECTION AND MAINTENANCE REQUIREMENTS FOR MOTOR VEHICLES.

Article

Editor's notes. - Effective February 1, 1994, Register 129, the regulations in 18 AAC 52 were comprehensively reorganized and revised. They replaced all previous regulations in this chapter, which were repealed simultaneously with the adoption of these regulations. The history line at the end of each section does not reflect the history of that provision before February 1, 1994, nor is the section numbering related to the numbering before that date. Previous provisions of and amendments to this chapter are on file in the Office of the Lieutenant Governor in Register 94, 5/19/85; Register 106, 6/2/88, and Register 125, 2/19/93.

ARTICLE 1. EMISSIONS INSPECTION AND MAINTENANCE REQUIREMENTS.

Section

18 AAC 52.005. APPLICABILITY AND GENERAL REQUIREMENTS. (a) Subject to the other provisions of this section, including the exemptions set out in (f) of this section, the maintenance requirements of 18 AAC 52.015(a) apply to

(1) a motorist; and

(2) a person engaged in the business of maintaining, repairing, or otherwise servicing emissions control systems.

(b) The requirements of (c) of this section apply to

(1) a motorist who resides in an inspection and maintenance (I/M) area identified in (g) of this section;

(2) a motorist whose motor vehicle is principally located or operated in an I/M area;

(3) a motorist who commutes into the Municipality of Anchorage I/M area;

(4) a motorist who attends school at the University of Alaska within the Fairbanks North Star Borough I/M program area; and

(5) a motorist described in (1) - (4) of this subsection whose motor vehicle is located within an I/M area on a public right-of-way, public land, or on commercial premises such as a parking lot that is open to the public.

(c) In addition to the requirements of (a) of this section,

(1) a motorist described in (b) of this section shall

(A) have that motorist's motor vehicle inspected every two years as required by this chapter unless

(i) the requirement is waived under 18 AAC 52.060; or

(ii) the vehicle is a model year (MY) 2004 or newer;
if the vehicle is a model year 2004 of newer, the vehicle's first inspection is due when the current calendar year equals the vehicle model year plus four years; subsequent inspections are due every two years after the year the vehicle's first inspection is due;

(B) have one of the following types of windshield stickers permanently affixed to the vehicle's windshield:

(i) certificate of inspection;

(ii) seasonal waiver;

(iii) new vehicle;

(iv) diesel exemption;

(C) comply with the maintenance practices for the motor vehicle emissions control system to reduce air pollution required by 18 AAC 52.015(b) and any additional emissions-related maintenance practices recommended by the manufacturer; and

(D) have the emission-related vehicle repairs required by 18 AAC 52.065 performed and, if the repairs are to be applied to the repair cost minimum, ensure that the repairs are made by a certified mechanic;

(2) a motorist described in (b)(1) of this section and a motorist described in (b)(2) of this section shall obtain a certificate of inspection as required under (1) of this section by having the vehicle inspected within 90 days before registration is due under AS 28.10.108;

(3) a motorist described in (b)(3) of this section shall have the vehicle inspected before commuting into the Municipality of Anchorage I/M area and every two years thereafter; and

(4) a motorist described in (b)(4) of this section shall have the vehicle inspected before attending the University of Alaska within the Fairbanks North Star Borough I/M program area and every two years thereafter for as long as the motorist attends the University of Alaska within the Fairbanks North Star Borough I/M program area.

(d) Except for a vehicle described in (f) of this section, the motorist of a vehicle registered in another state shall obtain a certificate of inspection within 30 days after

(1) a change in the motorist's residence from a non-I/M area to an I/M area; or

(2) the vehicle begins to be principally located or operated in an I/M area.

(e) In addition to the requirements of (a) - (d) of this section, this chapter

(1) governs an I/M program established by an implementing agency and requires the implementing agency to conduct that program in accordance with this chapter and the department's *Alaska I/M Program Manual* dated December 16, 2005, which is adopted by reference;

(2) requires a person engaged in the business of maintaining, repairing, or otherwise servicing vehicle emissions control systems in an I/M area to conduct business in accordance with this chapter, including, when applicable,

(A) meeting the certification requirements for

(i) mechanics set out in 18 AAC 52.400; and

(ii) stations set out in 18 AAC 52.415; and

(B) using the inspection and repair procedures required by this chapter, including the procedures set out in the program manual; and

(3) requires a department, agency, or instrumentality of the federal government with jurisdiction over a property or facility within an I/M area, before a vehicle is allowed to operate on that property or facility, to

(A) require employees or contractors who operate a vehicle on the property or facility to furnish proof of compliance with this chapter; for purposes of this subparagraph, proof of compliance may be

(i) a valid certificate of inspection for the vehicle;

(ii) proof of vehicle registration in the I/M area; or

(iii) another method approved by the implementing agency; and

(B) obtain a valid certificate of inspection for each motor vehicle owned or leased by the federal government and located or operated on the property or facility, unless the implementing agency, in its discretion, allows the use of an alternate method of compliance with this subparagraph.

(f) The I/M requirements of this chapter do not apply to

(1) a 1967 or older motor vehicle;

(2) Repealed 02/18/2006;

(3) a gasoline-powered motor vehicle that has an unladen weight of 12,001 pounds or heavier;

(4) a test vehicle for which the department has issued a written exemption;

(5) a military tactical vehicle such as a tank;

(6) a motorcycle, golf cart, all-terrain vehicle, snow machine, and motor-driven cycle (moped);

(7) a motor vehicle that has been or will be in Alaska for less than 30 days; or

(8) an electric vehicle.

(g) For purposes of this chapter, each of the following is an I/M area:

(1) the Municipality of Anchorage; and

(2) the Fairbanks North Star Borough;

(h) The department will administer an I/M program that applies to motorists who commute into the Municipality of Anchorage I/M area, as provided in 18 AAC 52.030.

(i) For purposes of this chapter, the department may, under 18 AAC 52.007, suspend or reestablish an I/M program in an I/M area described in (g) of this section and in 18 AAC 52.030. Not less than 30 days before the suspension or 275 days before the reestablishment of an I/M program in an I/M area, the department will send notice to that I/M area's

(1) newspaper of general circulation for publication; and

(2) local air pollution control program office. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/4/95, Register 133; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161; am 02/18/2006, Register 177; am__/__/____, Register___)

Authority: AS 46.03.010 AS 46.14.030 AS 46.14.510
AS 46.03.020

Editor's note: As provided in AS 45.45.400(a), certain requirements of this chapter extend to a person engaged in the business of selling used vehicles. The program manual adopted by reference in this section may be reviewed at or obtained from the implementing agency or the department's Anchorage, Fairbanks, or Juneau office.

18 AAC 52.007. SUSPENSION AND REESTABLISHMENT OF I/M REQUIREMENTS. (a) Subject to (b) of this section, if an I/M area attains the NAAQS for carbon monoxide, and after consultation with and approval by the EPA administrator of an applicable revision to the *State Air Quality Control Plan*, adopted by reference in 18 AAC 50.030, the department will suspend the I/M program of this chapter in that I/M area pursuant to 18 AAC 52.005(i).

(b) If the I/M program in an I/M area is suspended under (a) of this section, and the I/M area violates the NAAQS for carbon monoxide, and the department determines through consultation with EPA that reestablishing the I/M program is the appropriate measure to implement under the *State Air Quality Control Plan*, adopted by reference in 18 AAC 50.030, the department will reestablish the I/M program under 18 AAC 52.005(i) and 18 AAC 52.030.

(c) In this section, "NAAQS" has the meaning given in 18 AAC 53.990. (Eff. __/__/___, Register ___)

Authority: AS 46.03.010 AS 46.14.030 AS 46.14.510
AS 46.03.020

18 AAC 52.010. I/M PROGRAM ADMINISTRATION OFFICE. There is created within the department's air quality improvement section, a department office responsible for administration and enforcement of all aspects of the I/M program (I/M office). The I/M office will

(1) administer and enforce the requirements of this chapter, including ensuring that the requirements of this chapter are followed under each I/M program implemented or administered under this chapter;

(2) evaluate, and approve or disapprove I/M program plans submitted under 18 AAC 52.035;

(3) accept complaints from the public against certified mechanics or stations;

(4) investigate and gather evidence regarding suspected violations of this chapter;

(5) suggest measures to resolve disputes between motorists and certified mechanics or stations;

(6) approve referrals to the referee facility described in 18 AAC 52.070;

(7) keep, as a public record, a list of the

(A) names and addresses of all certified mechanics and stations; and

(B) manufacturers of equipment certified for use under this chapter;

(8) provide materials to assist the public in understanding and complying with the requirements of this chapter;

(9) send each certified station that is subject to a department-administered I/M program, a newsletter describing recently adopted ordinances, procedure changes, suspension or revocation hearings, and any other information that the program administrator determines will benefit the I/M program;

(10) routinely evaluate the effectiveness of each I/M program created under this chapter through the analysis of data obtained from certified stations and from special studies;

(11) at the request of the office of the governor, submit a report to the governor on the status and effectiveness of the statewide I/M program; the I/M office will have a copy of this report available at the I/M office for public review; and

(12) prepare reports for a department-administered I/M program, upon request of the department; the reports must fulfill the requirements of 18 AAC 52.037(a) and (b)(1) - (5). (Eff. 2/1/94, Register 129; am 1/1/97, Register 140; am 1/1/98, Register 144; am 02/18/2006, Register 177)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.015. MOTOR VEHICLE MAINTENANCE REQUIREMENTS. (a) A motorist and a person engaged in the business of maintaining, repairing, or otherwise servicing vehicle emissions control systems shall

(1) ensure that emissions, excluding condensed water vapor, from a

(A) gasoline-powered motor vehicle are not visible for more than any five consecutive seconds;

(B) diesel-powered motor vehicle do not result in a reduction of visibility of greater than 40 percent through the exhaust effluent for more than any five consecutive seconds;

(2) ensure that emissions-related adjustments are made as specified by the vehicle manufacturer;

(3) ensure that original and aftermarket emissions-related parts are properly installed and functioning according to specifications and have not been subject to tampering;

(4) not make nor allow to be made any unauthorized modification to the engine or emissions control system; and

(5) use, or place, only unleaded gasoline in a vehicle designed for the exclusive use of unleaded gasoline.

(b) In addition to the requirements of (a) of this section, a motorist described in 18 AAC 52.005(b) shall ensure that an emissions-related repair is made, and that the repair is performed by a mechanic certified under this chapter if the motorist wants to apply that repair to the repair cost minimum.

(c) In addition to the other applicable requirements of this chapter, a mechanic certified under this chapter who repairs a vehicle that has failed an I/M inspection shall use repair procedures issued by the

(1) implementing agency and approved by the department; or

(2) department, if it administers the I/M program; the applicable procedures under this paragraph are set out in Part IV of the program manual.

(d) A motorist may request that a vehicle failing an emissions inspection (I/M test) at a certified station be inspected, at no cost, at a referee facility for verification and documentation of the inspection failure, if the vehicle is covered by a manufacturer's emissions warranty as provided in 42 U.S.C. 7541(a) and (b) (Clean Air Act, sections 207(a) and (b)). The motorist may return to the referee facility for a free verification that I/M-related repairs were properly made.

(e) Repealed 1/1/2000. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/4/95, Register 133; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 02/18/2006, Register 177)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.020. CERTIFICATE OF INSPECTION REQUIREMENTS. (a) A certificate of inspection required under this chapter may be issued only by the implementing agency, its designee, its referee facility, or a station certified under 18 AAC 52.415.

(b) A motorist described in 18 AAC 52.005(b)(1) or (b)(2) shall obtain and renew a certificate of inspection as required by 18 AAC 52.005(c)(2). A motorist described in 18 AAC 52.005(b)(3) shall obtain and renew a certificate as required by 18 AAC 52.005(c)(3). A motorist described in 18 AAC 52.005(b)(4) shall obtain and renew a certificate as required by 18 AAC 52.005(c)(4).

(c) A person, including a person in military service, who temporarily resides in this state for more than 30 days and who owns or leases a vehicle that is principally located or operated in an I/M area shall obtain a certificate of inspection for that vehicle, even if the vehicle is not required to be registered in this state under AS 28.10.011. A temporary resident shall obtain the certificate of inspection within 30 days after the vehicle enters this state and is principally located or operated in an I/M area.

(d) A motorist described in 18 AAC 52.005(b) shall keep affixed to the inside lower left corner of the front windshield or display in a certificate holder readily visible through the front windshield

(1) a certificate of inspection windshield sticker for the specific vehicle that has passed an I/M test; the sticker must be affixed by the certified mechanic who inspected the vehicle ; the certified mechanic may not place a windshield sticker in a certificate holder; or

(2) a waiver, new vehicle, or exemption windshield sticker for a vehicle for which the implementing agency requires a sticker to be displayed under 18 AAC 52.025(c); the sticker must be affixed by the implementing agency or the designee of the implementing agency.

(e) The implementing agency shall sell the certificate of inspection to a certified station in lots of 25. Each sticker must contain a unique serial number, and the implementing agency shall record the serial numbers of each sticker sold to a station. The sticker must comply with the requirements of 18 AAC 52.025, be approved by the department, and be pre-printed using materials, color, and patterns that minimize the risk of forgery. The design of the sticker and any change to the design must be approved by the department. If the design or color of a certificate of inspection is changed, the implementing agency shall permit a certified station to exchange any unused certificates for new certificates at no charge, or the implementing agency shall refund to the certified station the fee paid for returned obsolete certificates.

(f) If the department administers an I/M program under 18 AAC 52.030, it will charge a

$20 fee for a certificate of inspection. If a department-administered I/M program, such as a program described in 18 AAC 52.005(h), is associated with an I/M program administered by an implementing agency, the department will charge the same fee as that charged by the implementing agency if that fee is lower than the fee set in this subsection. Nothing in this subsection prohibits an implementing agency other than the department from imposing a fee higher or lower than $20.

(g) If a certificate of inspection or other required windshield sticker that has been issued is lost, destroyed, or mutilated, a replacement certificate may be issued to the motorist if the original certificate or other required windshield sticker can be accounted for to the satisfaction of the implementing agency. The replacement certificate must be traceable to the original certificate or other windshield sticker issued.

(h) If, after obtaining a replacement certificate of inspection under (g) of this section, the motorist finds the lost original certificate of inspection, that motorist shall return the original to the implementing agency.

(i) For a department administered I/M program under 18 AAC 52.030, the department will charge a $20 fee for a replacement certificate.

(j) If registration of a vehicle is refused under AS 28.10.041 because the certificate of inspection for the vehicle is inadequate because of an act or omission of a certified mechanic or station, the station shall retest the vehicle at no charge and issue another certificate if the vehicle passes the I/M test. If registration of a vehicle is refused because the certificate is inadequate because of an act or omission of the motorist, the motorist shall obtain another certificate and pay the appropriate fee. If a second certificate is issued under this subsection, the station shall collect the original parts of the certificate, and shall invalidate the certificate or otherwise account for the original certificate to the satisfaction of the implementing agency. The station shall note the reason for replacement of the certificate, and return each part of the certificate, including the windshield sticker, to the implementing agency for a refund of the cost of the certificate.

(k) A motor vehicle dealer may use a certificate of inspection that was issued within the previous 12 months to register a used motor vehicle under AS 28.10.011 if the

(1) dealer registers the vehicle in the purchaser's name; and

(2) certificate was issued while the vehicle was held in the dealer's inventory for sale.

(*l*) If a certificate of inspection was used under (k) of this section to register a used vehicle, that certificate may not be used again to register the vehicle or to renew the vehicle registration.

(m) A certificate of inspection is an “emissions inspection and maintenance certificate” or an “emissions inspection certificate” for purposes of the transfer of ownership of a motor vehicle under AS 28.10.271(d). (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161; am 02/18/2006, Register 177)

Authority: AS 44.46.025 AS 46.14.030 AS 46.14.510
AS 46.03.020

18 AAC 52.025. VISUAL IDENTIFICATION OF CERTIFICATE OF INSPECTION, WAIVERS, AND EXEMPT VEHICLES. (a) The windshield sticker certificate of inspection must be

(1) easy to observe from outside a vehicle;

(2) of a quality that is difficult to counterfeit, difficult to remove without destroying it, and durable enough to last until the next inspection without fading, peeling, or otherwise deteriorating; and

(3) affixed to the vehicle's windshield as required by 18 AAC 52.020(d) at the time of inspection by the certified mechanic who performs the inspection; and

(b) For purposes of vehicle registration, an electronic record of the certificate of inspection must be received by the division of motor vehicles, Department of Administration.

(c) When a type of vehicle is not required to get an I/M test, the implementing agency may require a windshield sticker that uniquely identifies that type of vehicle. A windshield sticker identifying a new vehicle, a vehicle waived under 18 AAC 52.060(a), or a vehicle exempted under 18 AAC 52.005(f) must

(1) be easy to observe from outside the vehicle;

(2) be of a quality that is difficult to counterfeit, difficult to remove without destroying it, and durable enough to last until the next renewal or inspection without fading, peeling, or otherwise deteriorating;

(3) be unique and noticeably distinguishable from the windshield sticker certificate of inspection;

(4) be affixed to the vehicle's windshield as required by 18 AAC 52.020(d) in the manner prescribed by the implementing agency; and
(5) have a unique number.

(d) An implementing agency shall

(1) require each certified station and new vehicle dealer to account for all windshield stickers that the implementing agency issues to that station or new vehicle dealer; and

(2) adopt enforcement procedures in its design document for appropriate action by the implementing agency against a station or new vehicle dealer that is either missing or cannot account for a windshield sticker or that has improperly issued a windshield sticker.

(e) An implementing agency may, and if the department is the implementing agency, the department will, in the case of a show, classic, or collector vehicle, certify the use of a certificate holder for the display of that vehicle's seasonal waiver issued under 18 AAC 52.060, subject to the requirements of (f) – (m) of this section, as an alternative to the requirement that the waiver be permanently affixed to the windshield.

(f) A certificate holder for a seasonal waiver must be

(1) clear and of a size that accommodates the seasonal waiver and provides an adequate surface for the waiver to be affixed;

(2) of an appropriate size and design to either rest on the dashboard of the vehicle or hang from the vehicle's rear-view mirror so that the certificate holder is plainly visible through the vehicle's windshield from a distance of eight feet;

(3) uniquely marked to allow for easy verification that the certificate holder is displayed in the appropriate vehicle;

(4) issued by the implementing agency; and

(5) displayed at all times.

(g) If the department administers an I/M program under 18 AAC 52.030, the department will charge a fee to recover the cost of the certificate holder. If a department-administered I/M program, such as the program described in 18 AAC 52.005(h), is associated with an I/M program administered by an implementing agency, the department will charge the same fee as that charged by the implementing agency. Nothing in this subsection prohibits an implementing agency other than the department from assessing a fee for a certificate holder.

(h) To be eligible to use a certificate holder in place of permanently affixing the seasonal waiver to the vehicle's windshield, the motorist must execute an affidavit attesting that the vehicle

(1) has been issued a valid seasonal waiver under 18 AAC 52.060; and

(2) is driven fewer than 2,500 miles per calendar year.

(i) If renewing a seasonal waiver, a motorist must provide adequate proof of the mileage that the vehicle was driven during the previous registration period on a calendar year basis.

(j) If a vehicle for which a certificate holder is issued is driven more than 2,500 miles in a calendar year during the registration period for which a certificate holder was issued for that vehicle, the motorist may not use the certificate holder any longer. The motorist shall forfeit and return the certificate holder to the implementing agency and obtain a certificate of inspection or seasonal waiver to be affixed to the inside lower corner and the front windshield.

(k) A motorist may not obtain a certificate holder for a camper or a motor home.

(*l*) The implementing agency shall assign a unique certificate holder for each vehicle. The certificate holder may not be transferred to a different motorist or vehicle. The certificate holder and waiver must be returned to the department or implementing agency if a seasonal waiver is denied under 18 AAC 52.060 or if the title to the vehicle is transferred to another motorist.

(m) A motorist may not display a certificate holder in a vehicle other than the vehicle for which it has been issued. If a motorist incorrectly displays, or fails to display, a certificate holder, the implementing agency shall revoke each certificate holder and seasonal waiver issued to that motorist. The motorist shall return each revoked certificate and seasonal waiver to the implementing agency. (Eff. 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161; am 02/18/2006, Register 177)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.030. DEPARTMENT-ADMINISTERED I/M PROGRAM. (a) The department will, in its discretion, and after notice and opportunity for public comment, administer an I/M program

(1) in any area where the department determines that a program is needed to attain or maintain the national ambient air quality standard for carbon monoxide by the date required by 42 U.S.C. 7512 (Clean Air Act, section 186), as amended through November 15, 1990;

(2) in an I/M area where an implementing agency

(A) determines that it will no longer administer the I/M program in that area; or

(B) is found by the department, under AS 46.14.410, to be administering an inadequate program; or

(3) that applies to motorists who commute into an I/M area but whose vehicles are not registered in that I/M area.

(b) A person subject to this chapter shall meet the applicable requirements of a department-administered I/M program, including the requirements of the program manual, in the same manner that the person would be required to meet the requirements of a program administered by an implementing agency.

(c) Subject to (d) of this section, if the department administers an I/M program, when it is stated in this chapter that the implementing agency

(1) "may," it means that the department will act, in its discretion; and

(2) "shall," it means that the department will act.

(d) Except as stated otherwise, the reporting requirements imposed upon an implementing agency under this chapter do not apply under a department-administered I/M program. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130)

Authority: AS 46.03.020 AS 46.14.410 AS 46.14.510
AS 46.14.030

18 AAC 52.035. I/M PROGRAM ADMINISTERED BY AN IMPLEMENTING AGENCY. (a) A municipality may not implement or administer an I/M program without department approval. The department will approve a program that

(1) establishes an I/M office that meets the requirements of 18 AAC 52.010(1) and (3) - (9); and

(2) meets the requirements of this section.

(b) An implementing agency shall authorize the issuance of a certificate of inspection for a motor vehicle that passes an I/M program conducted as required by this section. Subject to department approval, an I/M program may be limited to certain model years and categories if the implementing agency shows

(1) that the I/M program would be adequate for a cost-effective system; and

(2) that, notwithstanding the limitation to certain model years and categories, the I/M program would meet or exceed the level of emissions control provided under this chapter.

(c) An implementing agency shall adopt the

(1) calibration and quality control procedures for an EIS and test equipment in 40 C.F.R. 51, Appendix A to Subpart S, as revised as of July 1, 1999, adopted by reference;

(2) emissions testing procedures in 40 C.F.R. 51, Appendix B to Subpart S, as revised as of July 1, 1996, adopted by reference; and

(3) EIS and test equipment specifications in 40 C.F.R. 51, Appendix D to Subpart S, as revised as of July 1, 1999, adopted by reference.

(d) To ensure that its I/M program meets or exceeds the performance standard achievable under the model I/M program described in this subsection, the implementing agency shall use a mobile source emission factor computer program as required by 40 C.F.R. 51.352(d), as revised as of July 1, 1996, adopted by reference, to determine the projected emissions level of its I/M program and then compare that level with the performance standard. The performance standard is expressed as the average emissions level in grams of carbon monoxide emitted per mile traveled by all gasoline-fueled mobile sources in an I/M area, calculated using a mobile source emission factor computer program as required by 40 C.F.R. 51.352(d) (1996), adopted by reference. The model I/M program includes the following features:

(1) centralized testing;

(2) biennial exhaust emissions testing at curb idle of 1968 and later model year light-duty vehicles;

(3) a 20 percent exhaust emissions failure rate for pre-1981 model year vehicles;

(4) a zero percent waiver rate among vehicles failing the initial inspection; and

(5) a 100 percent compliance rate among all vehicles subject to the program.

(e) An implementing agency that is a municipality operating an I/M program shall submit an implementation plan for department approval. The plan must include

(1) steps to achieve a program as effective as the model program described in (d) of this section;

(2) a program manual that contains specifications and procedures that are at least equivalent to those

(A) required under this chapter, including any program features additional to those features described in the model program described in (d) of this section; and

(B) in the program manual adopted by reference in this chapter, including any program features additional to those features described in the model program described in (d) of this section;

(3) written policies and procedures for

(A) certification of mechanics, inspection and repair stations, and equipment, in accordance with 18 AAC 52.095;

(B) achieving maximum compliance of vehicles subject to the program, including vehicles commuting into the I/M area and vehicles operated at federal facilities in the I/M area;

(C) use of replacement parts and engine changes in vehicles subject to the program;

(D) a quality assurance program to review the performance of certified mechanics and stations;

(E) an enforcement program that is at least as stringent as the one described in 18 AAC 52.100, and a quality control program to achieve maximum compliance by motorists;

(F) an enforcement program at least equivalent to that described in 18 AAC 52.105, to ensure mechanic and station compliance with the program;

(G) emissions testing, visual and functional checks of vehicles, inspections using OBDII systems of applicable vehicles, and repair of emissions-related defects by certified mechanics and stations;

(H) the collection and analysis of inspection data;

(I) providing assistance, through the documentation of vehicle malfunctions, to motorists who have warranty claims with manufacturers;

(J) the operation of a referee facility to verify and document tests and repairs performed by certified mechanics or stations, and to otherwise carry out the functions described in 18 AAC 52.070; and

(K) providing technical assistance to certified mechanics, the repair industry, and motorists in diagnosing and repairing emissions-related defects; and

(4) verification of adequate funding and personnel to properly administer the program.

(f) A municipality that seeks to implement an I/M program or to amend an I/M program previously approved by the department shall submit to the department for approval an implementation plan and schedule that meet the requirements of (e) of this section. A municipality seeking approval of an implementation plan or an amendment shall submit the proposed plan or amendment to the department at least one year before the proposed implementation date and shall include a schedule for implementing the plan or amendment by the proposed date.

(g) The implementing agency shall ensure that certified mechanics and certified stations meet the requirements of this chapter, and that I/M inspections are performed only by certified mechanics.

(h) An implementing agency shall conduct enforcement, quality assurance, and quality control programs as described in this section to ensure that inspections and repairs are properly performed by certified mechanics and that motorists are in compliance with program requirements.

(i) An implementing agency may allow a certified station to determine whether Parts IV and V of the program manual allow the use of an aftermarket part in an I/M area. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/4/95, Register 133; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510
AS 46.14.010

18 AAC 52.037. REPORTING REQUIREMENTS FOR AN I/M PROGRAM ADMINISTERED BY AN IMPLEMENTING AGENCY. (a) Within 30 days after receiving a request from the department for a report under (b) or (c) of this section, an implementing agency shall submit the report to the department.

(b) A report that the department requests of activity during the previous calendar quarter must contain

(1) the raw emissions test data collected from each motor vehicle inspected during the quarter;

(2) a statistical test data report, including

(A) the number and percentage of vehicles receiving each type of waiver described in 18 AAC 52.060;

(B) a list by model year and vehicle type of the number of vehicles tested, as set out in Table 1 of this subparagraph;

Table 1. Vehicle Types

Vehicle Type	**Definition**
LDGV	light-duty gasoline-fueled vehicles (passenger cars) not exceeding 8500 lbs. GVWR
HDGV	heavy-duty gasoline-fueled vehicles over 8500 lbs. GVWR (heavier commercial trucks, buses and motorhomes)
LDGT1	light-duty gasoline-fueled trucks not exceeding 6000 lbs. GVWR (lighter pick-up trucks and vans)
LDGT2	light-duty gasoline-fueled trucks over 6000 lbs. GVWR and not exceeding 8500 lbs. GVWR (heavier pick-up trucks and vans, and many commercial trucks)

(C) a list, by model year and vehicle type, of the number and percentage of

(i) vehicles that failed an initial emissions test, an initial tailpipe emissions test, and each type of initial emissions control component check;

(ii) initially failed vehicles that failed the first retest for tailpipe emissions;

(iii) initially failed vehicles that received a waiver;

(iv) initially failed vehicles that passed the first or subsequent retest for tailpipe emissions;

(v) initially failed vehicles that passed each emissions control component check on the first or subsequent retest by component; and

(vi) vehicles with no known final outcome;

(D) a list, by model year and test station, of

(i) the number of initial tests; and

(ii) the initial test failure rate; and

(E) the average increase or decrease in vehicle emissions levels after repairs, by model year and vehicle type;

(3) a quality assurance report, including

(A) the number of certified stations operating throughout the quarter, and the number operating for part of the quarter; for the stations operating throughout the quarter, the report must include the number of stations that

(i) received, or did not receive, an overt performance review;

(ii) received, or did not receive, a covert performance review; and

(iii) were closed as a result of an overt performance review;

(B) the number of covert performance reviews

(i) conducted with a vehicle set to fail the emissions test, or the OBDII portion of the I/M test, one or more visual or functional checks, or both the emissions test or the OBDII portion of the I/M test and one or more visual or functional checks; and

(ii) that resulted in a false pass for the emissions test, for the OBDII portion of the I/M test, for one or more visual or functional checks, or for both the emissions test or the OBDII portion of the I/M test and one or more visual or functional checks;

(C) the number of certified mechanics and stations whose performance reviews resulted in a verbal warning, a written warning, a notice of violation, a citation, a fine or other penalty, or a suspended or revoked certification, or that resulted in the mechanic being suspended or fired, or in the mechanic or station being prohibited from performing a repair or inspection under this chapter;

(D) the number of mechanics who, at the end of the quarter, are certified to conduct testing on motor vehicles that are principally located or operated in the area for which the implementing agency is operating an I/M program, including the number of mechanics who

(i) received, or did not receive, an overt performance review;

(ii) received, or did not receive, a covert performance review;

(E) the number of administrative hearings conducted by the implementing agency to consider an action against a certified mechanic or station, and the result of each hearing;

(F) the amount collected in fines from certified mechanics and stations, listed by type of violation; and

(G) the number of vehicles used for covert performance reviews during the year;

(4) a quality control report that lists

(A) the number of inspection stations and EISs used in the program;

(B) the number of equipment reviews, listed by station or EIS;

(C) the number and percentage of stations and EISs that failed an equipment review;

(D) the number of EISs that were locked out; and

(E) the number and percentage of stations and EISs closed as a result of an equipment review; and

(5) an enforcement report that lists

(A) an estimate of the number of vehicles subject to the program, including the results of an analysis of the registration database;

(B) the percentage of vehicles in compliance, based on a comparison of the number of certificates of inspection issued with the number of subject vehicles; if more than one certificate of inspection was issued to the same audit vehicle, the certificate and vehicle should be counted only once;

(C) the number of certificates of inspection issued to certified stations by the implementing agency, and the number of certificates that are unaccounted for;

(D) the number of waivers granted under 18 AAC 52.060(a) and the number of time extensions granted under 18 AAC 52.060(d);

(E) the number of compliance surveys, including parking lot surveys, conducted, the number of vehicles surveyed in each survey, and the noncompliance rate found during each survey;

(F) a detailed report on actions taken by the implementing agency, on its own or in cooperation with the department and the division of motor vehicles, to prevent motorists from

(i) falsely registering a vehicle outside the I/M area;

(ii) falsely changing fuel type or weight class on the vehicle registration;

(iii) driving a vehicle in the I/M area from November 1 through March 31 after obtaining a seasonal waiver under 18 AAC 52.060(a)(3) for that vehicle; and

(iv) commuting into the Municipality of Anchorage and failing to comply with this chapter;

(G) the results of any special study of the frequency of the violations listed in (F) of this paragraph;

(H) the total amount of fines imposed by the Alaska Court System or by an implementing agency that is a municipality for

(i) driving with an expired registration or for misrepresenting the motorist’s residential address for purposes of vehicle registration; or

(ii) displaying a windshield sticker on a vehicle that is not in compliance with this chapter; and

(I) the number of registration file evaluations, including the number of registrations reviewed and the compliance rate found in each evaluation.

(c) A report that the department requests of activity during the previous 12 months must describe any

(1) changes made during that 12-month period in program design, funding, personnel levels, procedures, regulations, and legal authority, with a detailed evaluation of the impact of each change on program effectiveness;

(2) program weakness or problems identified within that twelve-month period and any plans to address each weakness or problem; and

(3) corrective actions taken and the results of those actions. (Eff. 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161; am 02/18/2006, Register 177)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510
AS 46.14.010

18 AAC 52.040. CENTRALIZED INSPECTION PROGRAM. To carry out the requirements of this chapter, an implementing agency may implement a centralized I/M program that

(1) meets the performance standards described in 18 AAC 52.035(d);

(2) is conducted at a test-only inspection facility operated by the implementing agency or its contractor; and

(3) otherwise meets the applicable requirements of this chapter. (Eff. 2/1/94, Register 129)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.045. DECENTRALIZED INSPECTION PROGRAM. To carry out the requirements of this chapter, an implementing agency may implement a decentralized I/M program that

(1) meets the performance standards described in 18 AAC 52.035(d); and

(2) otherwise meets the applicable requirements of this chapter. (Eff. 2/1/94, Register 129)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.050. EMISSIONS STANDARDS. (a) For a vehicle to pass an I/M program inspection, it must

(1) have emissions levels at or below the standards in this section and 18 AAC 52.055; this requirement does not apply to light-duty 1996 or newer model year vehicles unless that vehicle's make, model, and model year has been exempted from the requirement for the OBDII portion of an I/M test due to a documented problem with the OBDII system of that specific make, model, and model year;

(2) have no missing, modified, disconnected, improperly connected, or defective emissions-related part identified by the mechanic during a visual or functional check or identified by the vehicle's OBDII system; and

(3) pass the OBDII portion of an I/M test if the vehicle is a light-duty 1996 or newer model year; reasons for failure of the OBDII portion of the I/M test include the vehicle's

(A) MIL being commanded on;

(B) second failed readiness evaluation in an inspection cycle;

(C) OBDII connector being either damaged or not accessible; and

(D) OBDII system not responding to a command for communication.

(b) A vehicle that does not meet the requirements of 40 C.F.R 85.2207, as revised as of July 1, 1998, adopted by reference, fails the OBDII check.

(c) A motorist whose vehicle has a missing, modified, disconnected, improperly connected, or defective emissions-related part shall repair the vehicle as required under 18 AAC 52.015 and 18 AAC 52.065.

(d) Unless an implementing agency imposes an alternative standard under 18 AAC 52.055, the standards set out in this section and illustrated in Figure 3 in Part IV, g. and Appendix B of the program manual may not be exceeded in an I/M area.

(e) For LDGVs as defined in Table 1 of 18 AAC 52.037(b), emissions standards for carbon monoxide, expressed as the percentage of carbon monoxide in the undiluted exhaust, are as follows:

(1) 1968 to 1971 model years: 5.0 percent at curb idle and 4.0 percent at 2500 rpm;

(2) 1972 to 1974 model years: 4.0 percent at curb idle and 3.0 percent at 2500 rpm;

(3) 1975 to 1980 model years: 2.0 percent at both curb idle and 2500 rpm;

(4) 1981 to 1993 model years: 1.0 percent at both curb idle and 2500 rpm;

(5) 1994 and newer model years: 0.5 percent at both curb idle and 2500 rpm.

(f) For LDT1 and LDGT2s as defined in Table 1 of 18 AAC 52.037(b), emissions standards for carbon monoxide, expressed as the percentage of carbon monoxide in the undiluted exhaust, are as follows:

(1) 1968 to 1972 model years: 5.0 percent at curb idle and 4.0 percent at 2500 rpm;

(2) 1973 to 1978 model years: 4.0 percent at curb idle and 3.0 percent at 2500 rpm;

(3) 1979 to 1983 model years: 2.0 percent at both curb idle and 2500 rpm;

(4) 1984 to 1993 model years: 1.0 percent at both curb idle and 2500 rpm;

(5) 1994 and newer model years: 0.5 percent at both curb idle and 2500 rpm.

(g) For HDGVs as defined in Table 1 of 18 AAC 52.037(b), emissions standards for carbon monoxide, expressed as the percentage of carbon monoxide in the undiluted exhaust, are as follows:

(1) 1968 to 1973 model years: 5.0 percent at both curb idle and 2500 rpm;

(2) 1974 to 1993 model years: 4.0 percent at both curb idle and 2500 rpm;

(3) 1994 and newer model years: 1.0 percent at both curb idle and 2500 rpm.

(h) For LDGVs, LDGT1s, and LDGT2s as defined in Table 1 of 18 AAC 52.037(b), emissions standards for hydrocarbons, expressed as the concentration of hydrocarbons in the undiluted exhaust, are as follows:

(1) 1968 to 1983 model years: 1,000 parts per million at both curb idle and 2500 rpm;

(2) 1984 to 1993 model years: 750 parts per million at both curb idle and 2500 rpm;

(3) 1994 and newer model years: 220 parts per million at both curb idle and 2500 rpm.

(i) For HDGVs as defined in Table 1 of 18 AAC 52.037(b), emissions standards for hydrocarbons, expressed as the concentration of hydrocarbons in the undiluted exhaust, are as follows:

(1) 1968 to 1993 model years: 1,000 parts per million at both curb idle and 2500 rpm;

(2) 1994 and newer model years: 220 parts per million at both curb idle and 2500 rpm.

(j) Each rotor of a rotary engine is the equivalent of one cylinder in determining the applicable emissions standards under this section.

(k) Except as provided in (l) of this section, a model year 1975 or newer vehicle equipped with an engine other than the engine originally installed by the manufacturer or an identical replacement of that engine must meet the following requirements to qualify for a certificate of inspection under this chapter:

(1) the resulting engine-chassis configuration must have been certified by either

the EPA or the CARB as having emissions that are the same as, or lower than, the original engine-chassis configuration installed in the vehicle;

(2) the emissions controls that were originally installed on the vehicle, as certified by the EPA or the CARB, must be retained on the vehicle;

(3) if the vehicle was originally equipped with one or more catalytic converters, the resulting engine-chassis configuration must be equipped with either the catalytic converter certified by EPA or CARB for that configuration or a replacement catalytic converter approved by the implementing agency; and

(4) if the vehicle was originally equipped with feedback controls and an evaporative emissions control system, that system must remain functional on the resulting engine-chassis configuration.

(*l*) Instead of meeting the requirements of (k) of this section, a motorist may submit the results of an emissions test performed on a vehicle described in (k) using the FTP or an alternate loaded mode mass emissions test procedure approved by the department. The implementing agency shall issue a certificate of inspection after receiving adequate proof that the vehicle has a mass emissions rate that is the same as, or lower than, the engine-chassis configuration originally installed in the vehicle. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 12/30/2000, Register 156; am 3/27/2002, Register 161)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

Editor's note: Listings of EPA-approved engine-chassis combinations are set out in a publication entitled *Federal Certification Test Results for 19__ [the publication is model-year specific] Model Year* for each vehicle model year of interest and may be purchased from the United States Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, telephone (703) 487-4600, (703) 487-4650, or (800) 553-6847 (sales).

18 AAC 52.055. ALTERNATIVE REQUIREMENTS, STANDARDS, AND TEST PROCEDURES. (a) The department will, in its discretion, approve alternative requirements, standards, and test procedures to those specified in this chapter.

(b) Subject to department approval, instead of the standards set in 18 AAC 52.050, an implementing agency may establish alternative

(1) tailpipe emissions standards, including mass emissions standards;

(2) steady-state or transient loaded mode test procedures for all or a portion of the vehicles subject to the I/M program; and

(3) procedures to certify compliance of vehicles with replacement engines and of other noncomplying vehicles, if those procedures include emissions standards for those vehicles while they are operated in a loaded mode.

(c) At least one year before establishing an alternative standard or procedure under this section, an implementing agency shall provide to the department proof that

(1) control of vehicle emissions under the alternative standard or procedure will meet or exceed the level of emissions control required by this chapter; and

(2) the alternative standard or procedure will not result in failure of more than two percent of properly constructed and maintained vehicles in any category of vehicles subject to this chapter to meet the alternative standard or procedure.

(d) Repealed 1/1/2000. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/97, Register 140; am 1/1/2000, Register 152)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.060. WAIVERS. (a) Any person may seek a waiver from passing an I/M program inspection, except that no waiver may be issued to a vehicle that is untestable due to a correctable defect, including those listed in 18 AAC 52.530(d). The motorist shall repair a correctable defect before the I/M test will be completed. Except as provided in this subsection, the implementing agency or its contractor may grant a waiver if the person proves to the implementing agency or its contractor that

(1) a certified mechanic at a certified station has attempted to repair a failed vehicle, has made the repairs required by 18 AAC 52.065(a) or (b), and the vehicle failed a retest performed after completion of the required repairs; a waiver issued under this paragraph is valid for one inspection cycle;

(2) the vehicle has a diesel engine; a waiver issued under this paragraph is valid until the vehicle is sold or the diesel engine is replaced with a non-diesel engine; the motorist need not renew a waiver issued under this paragraph, but shall present it to the division of motor vehicles when the vehicle is first registered after becoming subject to this chapter or if the title to the vehicle is changed; if required by the implementing agency under 18 AAC 52.025(c), visual identification of a vehicle with a waiver for a diesel engine issued under this paragraph is by windshield sticker as provided in 18 AAC 52.025(c);

(3) the vehicle qualifies for a seasonal waiver; a waiver issued under this paragraph is valid for one inspection cycle; the implementing agency may issue a seasonal waiver if the motorist certifies in writing that the vehicle will not be operated from November 1

through March 31 in an I/M area, a nonattainment area, or a maintenance area; the written statement must appear on a waiver form that bears a notice to the motorist that

(A) a false statement is punishable by law; and

(B) if, between November 1 and March 31, the vehicle is either operated or parked on a public right-of-way, on public land, or on commercial premises open to the public in an I/M area, a nonattainment area, or a maintenance area, the seasonal waiver immediately becomes void, and

(i) the implementing agency will not approve another seasonal waiver for that vehicle or any other vehicle owned or leased by the motorist, except for good cause;

(ii) the motorist may not transfer ownership of a vehicle for which the seasonal waiver has become void or operate that vehicle after a transfer of the title unless the vehicle has a valid certificate of inspection; and

(iii) a subsequent motorist of a vehicle for which the seasonal waiver has become void is eligible for a seasonal waiver for that vehicle only if the subsequent motorist is not a member of the immediate family of and does not live in the same household as the motorist who owned or leased the vehicle at the time the vehicle's waiver became void;

(4) special circumstances exist that make it impractical to test the vehicle; a waiver issued under this paragraph is valid for one inspection cycle;

(5) the vehicle would not be expected to achieve emissions reductions after full repair of the vehicle to manufacturer's specifications for reasons such as pattern failure; a waiver issued under this paragraph is valid for one inspection cycle;

(6) the vehicle has been modified to use only compressed natural gas (CNG), methanol, or liquefied petroleum gas, and

(A) no emissions control device, other than the thermostatically controlled air cleaner inlet or the evaporative emissions control system, has been disconnected or removed from the vehicle;

(B) emissions test data are available indicating that the vehicle has an idle and parked throttle air-fuel ratio that is not richer than stochiometric; and

(C) the vehicle is not a dual-fuel vehicle; a waiver issued under this paragraph is valid until the vehicle is sold or is modified to use other than natural gas, methanol, or liquefied petroleum gas;

(7) the vehicle is registered in, but not located or operated in, an I/M area, a non-attainment area, or a maintenance area; a waiver issued under this paragraph is valid for one inspection cycle unless the vehicle returns to an I/M area, a nonattainment area, or a maintenance area, at which time the waiver is void, and the vehicle must be inspected; to qualify for a waiver under this paragraph, the motorist shall submit to the implementing agency

(A) an application, signed by the motorist;

(B) adequate proof that the vehicle is located or operated outside, and not in, an I/M area, a nonattainment area, or a maintenance area; and

(C) a copy of a current certificate of inspection issued in the area where the vehicle is located or operated, if an inspection is required in that area; a written statement must appear on the waiver form that bears a notice to the motorist that

(i) a false statement is punishable by law; and

(ii) if the vehicle is located or operated in the I/M area, a non-attainment area, or a maintenance area after the waiver is issued under this paragraph, the waiver immediately becomes void, and the implementing agency will not approve another waiver for that motorist under this paragraph; a subsequent owner of a vehicle with a waiver voided under this clause shall provide a current certificate of inspection to the implementing agency before the vehicle will be eligible for a future waiver under this paragraph; and

(8) a certified mechanic has determined as part of an I/M test performed under 18 AAC 52.540(a) that the vehicle cannot be repaired because the parts necessary for repair are unavailable; a waiver issued under this paragraph is valid for one inspection cycle.

(b) Before issuing a waiver under (a)(1) of this section, the implementing agency or its contractor shall

(1) verify that the cost of repairs meets or exceeds the repair cost minimum; and

(2) establish a method to monitor the vehicle until it meets I/M program requirements.

(c) Repealed 1/1/97.

(d) The implementing agency may grant a motorist a time extension not to exceed one inspection cycle to obtain needed repairs on a vehicle in the case of

(1) economic hardship when waiver requirements are not met; the implementing agency may grant only one time extension under this paragraph and shall revoke the extension if it is determined that the motorist no longer qualifies for an extension under this paragraph; the implementing agency may grant an economic hardship extension only if the motorist proves that

(A) the motorist's adjusted gross income, as computed for the preceding year and reported to the United States Department of the Treasury, Internal Revenue Service (IRS), is at or below the poverty level as determined under the United States Department of Health and Human Services poverty guidelines for this state published at 73 Fed. Reg.3971 – 3972 (January 23, 2008), adopted by reference in this chapter; for a time extension under this subparagraph, the motorist must submit a copy of the motorist's federal income tax return filed for the year preceding the extension request; or

(B) unusual circumstances exist such as health problems or other extra-ordinary expenses; for a time extension under this subparagraph, the motorist must submit

(i) a copy of the motorist's income tax return filed with the IRS for the year preceding the extension request, but the motorist is not required to comply with the requirement of this clause if the IRS did not require the motorist to file a return;

(ii) a budget sheet that details current income, assets, and liabilities;

(iii) vehicle registration documentation; and

(iv) documentation of the extraordinary expenses, such as medical bills, that support the claim of unusual circumstances; or

(2) Repealed 1/1/98.

(e) Repealed 1/1/97.

(f) Except for a waiver issued under (a)(2) or (a)(6), or an extension under (d)(1) of this section, a motorist may apply to the implementing agency for a new waiver each year that the vehicle qualifies for a waiver under this section. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/4/95, Register 133; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161; am 02/18/2006, Register 177; am __/__/____, Register ___)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

Editor's notes. - A copy of the federal poverty guidelines referred to in this section may be obtained from an implementing agency, from the department, or on the Internet. The Federal Register is usually available at state and court libraries, or on the Internet.

18 AAC 52.065. EMISSIONS-RELATED REPAIR COST MINIMUM. (a) Unless provided otherwise in this section, a motorist who is subject to 18 AAC 52.005(c) shall complete necessary emissions-related repairs as required in (d) of this section. If the cost of completing all repairs exceeds $450, the motorist shall complete those repairs for each inspection cycle with a total cost of no less than $450. If the total cost of all repairs is less than $450, the motorist shall complete all repairs. If a certified mechanic determines under 18 AAC 52.540(a) that parts are unavailable for one or more repairs, the motorist shall complete those repairs for which all parts are available up to $450. If all repairs have been made except one for which parts are unavailable, the motorist shall apply for an unavailable parts waiver as described in 18 AAC 52.060(a)(8). The cost of repairs performed by a person who is not certified under this chapter or the cost of a repair necessary to correct a safety problem may not be applied toward the repair cost minimum.

(b) Repealed 1/1/2000.

(c) The motorist shall complete all repairs necessary to comply with this chapter, regardless of cost, if

(1) the vehicle was subjected to an unauthorized or illegal modification;

(2) the vehicle is owned or leased by a fleet operator; or

(3) a manufacturer's warranty or an insurance claim will compensate the owner for the repair.

(d) The motorist shall complete repairs that eliminate any visual or functional defect identified on the vehicle inspection report (VIR). A partial repair may not be applied to the repair cost minimum.

(e) An implementing agency may, with department approval, establish an alternate repair cost minimum if the implementing agency can demonstrate that the alternate minimum will result in the issuance of an equal or lesser number of repair cost waivers. (Eff. 2/1/94, Register 129; am 1/1/97, Register 140; am 1/1/98, Register 144; 1/1/2000, Register 152)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.070. REFEREE FACILITY. (a) Each implementing agency or its contractor shall maintain and operate a referee facility to carry out the functions described in this section.

(b) The implementing agency shall ensure that the referee facility is equipped with instrumentation and other equipment and supplies necessary to determine whether a vehicle passes or fails an inspection test performed under this chapter.

(c) Subject to the implementing agency's approval, the referee facility may charge an inspection fee to inspect a vehicle not previously tested. If a vehicle passes an inspection performed at the referee facility, the referee facility may collect a fee for the certificate of inspection. A referee facility may not charge for an I/M test if the motorist has already paid for an I/M test and has a complete vehicle inspection report (VIR) showing a completed I/M test at a certified station within the past 90 days. If the vehicle fails the inspection and does not meet the requirements for a repair cost waiver under 18 AAC 52.060(a)(1), the referee facility may provide the motorist with a required-repair form that describes the repairs that must be made. The motorist shall make the repairs described on the required-repair form within 60 days. If the motorist disputes the results of a failing inspection performed by the referee facility, the referee facility may perform additional functional tests to verify the reason for failure.

(d) If directed by the implementing agency, the referee facility shall

(1) verify and document inspection failure as described in 18 AAC 52.015(d);

(2) determine whether a waiver should be issued under 18 AAC 52.060;

(3) confirm the results of tests and repairs performed by a certified mechanic or station if a motorist disputes the work of the mechanic or station;

(4) inspect vehicles that have been rejected from testing at a certified station because of engine or fuel changes;

(5) provide assistance in monitoring certified stations and mechanics under 18 AAC 52.440;

(6) test a vehicle and determine the correct procedure to follow for repairs after a vehicle has received an initial I/M test ("I" test), I/M-related repairs, and an after-repairs test ("A" test) at a certified station, and still fails; if the vehicle passes the initial test, a further I/M test is not required in that inspection cycle unless the ownership of the vehicle is transferred as provided in AS 28.10.271(d);

(7) perform an I/M test if a technical problem prevents a certified station from performing a standard test;

(8) evaluate a catalytic converter for efficiency after the vehicle fails the tailpipe test and no other faults are found;

(9) test a vehicle that has had an engine change if the vehicle has not been tagged by the referee facility with a label containing instructions for properly testing the vehicle;

(10) evaluate a vehicle that fails the "I" test if the certified station refuses to perform repairs because the mechanic determines that the repairs would be ineffective and emissions would not be reduced;

(11) evaluate grey market vehicles as provided in 18 AAC 52.080;

(12) test vehicles referred by an I/M field inspector;

(13) evaluate vehicles covered by a manufacturer's emissions warranty that fail an "I" test and exhibit no indication of tampering;

(14) evaluate vehicles assembled by a person who is not an automobile manufacturer; and

(15) provide other services as directed by the implementing agency.

(e) The referee facility shall make appointments only when instructed to do so by the I/M office. A person referred to the referee facility shall bring with him or her the vehicle, the vehicle registration, a completed, legible referee referral form, and any additional documentation required by (1) - (22) of this subsection for each type of referral, as follows:

(1) **Alternate Fueled-Vehicle Inspection** - no other documentation is required;

(2) **Catalytic Converter Evaluation** - a failing "I" test VIR, an itemized estimate, and a work order or invoice;

(3) **Repair Cost Waiver** - a failing "I" test VIR, an itemized estimate, and a work order or invoice;

(4) **Motorist Complaint that Station is Unable to Resolve/Vehicle Tested** - a failing "I" test VIR, an itemized estimate, and a work order or invoice;

(5) **Motorist Complaint that Station is Unable to Resolve/Vehicle Not Tested** - no other documentation is required;

(6) **Review of Disputed Test or Inspection** - a passing or failing "I" test VIR, an itemized estimate if the test was failed, and a work order or invoice;

(7) **Dual Exhaust or Headers** - an "I" test VIR, an itemized estimate, and a work order or invoice;

(8) **Engine Changes** - no other documentation is required;

(9) **Failed Vehicle after "I" Test, Repairs and "A" Test** - a failing "I" test VIR, a failed "A" test VIR, an itemized estimate, and a work order or invoice;

(10) **Failed Vehicle with Increased Emissions after "I" Test, Repairs and "A" Test** - a failing "I" test VIR, a failed "A" test VIR, an itemized estimate, and a work order or invoice;

(11) **Failed Vehicle with Increased Emissions after "I" Test, Repairs and "A" Test, Referred for Verification of Proper Repairs** - a failing "I" test VIR, a failed "A" test VIR, an itemized estimate, and a work order or invoice;

(12) **Failed Vehicle/Mechanic Refuses to Repair Because Repairs will Not Reduce Emissions** - a failing "I" test VIR, a failed "A" test VIR, an itemized estimate, and a work order or invoice;

(13) **Grey Market Vehicles** - no other documentation is required;

(14) **I/M Inspector Request** - any appropriate I/M documentation provided by the I/M inspector;

(15) **Motorhomes with Nonconforming Engine Changes** - no other documentation is required;

(16) **Parts On Order** - a failing "I" test VIR, an itemized estimate of repairs, an itemized work order or invoice showing full payment in advance for all parts and labor, and a "parts on order" form, fully and legibly completed;

(17) **Unavailable Parts -** proof provided by the certified mechanic who performed the test that the required parts are unavailable, including

(A) a failing "I" test VIR;

(B) an itemized estimate of repairs; and

(C) an itemized work order or invoice that

(i) identifies each unavailable part by its full name and part number, if known;

(ii) confirms that a part is no longer available locally or by order;

(iii) provides the name of each parts supplier contacted, which must include a minimum of three, one of which must be the vehicle dealer; and

(iv) the name of each person spoken to at each part supplier;

(18) **Excessive Sample Dilution** - an aborted "I" test VIR that shows excessive sample dilution, and a work order or invoice;

(19) **Incompatibility/Technical Problem** - an aborted "I" test VIR if produced, and a work order or invoice;

(20) **Twin Air Pump Vehicle that Failed the Tailpipe Test** - a failing "I" test VIR;

(21) **Vehicle Assembled by a Private Party (Kit Car)** - no other documentation is required; and

(22) **Warranty Verification** - a failing "I" test VIR.

(f) A certified mechanic shall perform the repairs listed on the required-repair form provided by the referee facility under (c) of this section. If the repairs cannot be completed for less than the repair cost minimum, or if parts are unavailable for one or more required repairs, the mechanic shall contact the referee facility before proceeding. The mechanic may not proceed with any repair until all of the required parts are present for that repair and the cost to the motorist is established. If the certified station agrees to perform the after-repair test and issue a certificate of inspection, the mechanic shall sign the required repair form certifying that all required repairs were properly performed. The certified station may not charge for the after-repair test. A certified station may not issue a certificate of inspection for a vehicle subject to a referee-required repair form without approval from the referee facility. After all referee-required repairs have been performed, the certified station shall contact the referee facility for further instructions.

(g) An implementing agency may establish alternative procedures to those set out in this section, with department approval. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.075. KIT CARS AND CUSTOM-MANUFACTURED VEHICLES. A kit car or custom-manufactured vehicle registered in Alaska before January 1, 1993, is subject to the emissions standards for 1974 model year vehicles set out in 18 AAC 52.050. The owner or lessee of a kit car or custom-manufactured vehicle that was first registered after December 31, 1992, but before January 1, 1998, shall use an engine and evaporative emissions control system from a vehicle of the same class that is certified to meet federal emissions standards applicable to 1988 model year vehicles. The owner or lessee of a kit car or custom-manufactured vehicle that was first registered after December 31, 1997, shall use an engine and evaporative emissions control system from a vehicle of the same class that is certified to meet federal emissions standards, including cold temperature carbon monoxide standards, applicable to 1996 model year vehicles. The owner or lessee shall ensure that the exhaust emissions controls originally intended to be used with the engine, including the computer and feedback control system, are installed and that the vehicle uses the same catalyst used with the engine in a certified vehicle or an aftermarket catalyst approved by the implementing agency. (Eff. 2/1/94, Register 129)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.080. GREY MARKET VEHICLES. (a) Except as otherwise provided in this section, the department will, and the implementing agency or referee facility may,

(1) inspect a grey market vehicle in accordance with importation documents issued by EPA or the manufacturer's emissions decal; and

(2) issue a certificate of inspection if the grey market vehicle passes, as required by Part IV of the program manual, the

(A) visual and functional inspections and the tailpipe emissions standards; or

(B) OBDII portion of the I/M test.

(b) If the importation documents and the manufacturer's emissions decal are not available, but the grey market vehicle has a United States title and has not been modified to comply with EPA emissions requirements, the department will, and the implementing agency or referee facility may

(1) inspect the vehicle according to the model year of the vehicle and the emissions control systems present on the vehicle at manufacture; and

(2) issue a certificate of inspection if the vehicle passes, as required by Part IV of the program manual, the

(A) tailpipe emissions standards; or

(B) OBDII portion of the I/M test.

(c) If the importation documents or the manufacturer's emissions decal are not available, but the grey market vehicle has a United States title and has been modified to comply with EPA emissions requirements, the department will, and the implementing agency or referee facility may

(1) inspect the vehicle according to the model year of the vehicle and the emissions control systems present on the vehicle at inspection; and

(2) issue a certificate of inspection if the vehicle passes, as required by Part IV of the program manual, the

(A) tailpipe emissions standards; or

(B) or OBDII portion of the I/M test.

(d) If the importation documents or the manufacturer's emissions decal are not available, and the grey market vehicle does not have a United States title, the department will not, and the implementing agency or referee facility may not, inspect the vehicle.

(e) This section does not relieve a motorist from any duty to obtain importation documents issued by EPA and the United States Department of Transportation.

(f) The repair cost minimum is the same for a grey market vehicle as it is for a vehicle manufactured in the United States. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/97, Register 140; am 1/1/98, Register 144; am 3/27/2002, Register 161)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.085. VEHICLE MODIFICATIONS. (a) Subject to (b) of this section, the referee facility shall, if requested by the motorist, issue a certificate of inspection for a vehicle that has been

(1) converted to dual-fuel use if

(A) the vehicle

(i) meets the emissions standards of 18 AAC 52.050 for the vehicle in its unmodified configuration when tested on each fuel that the vehicle burns; or

(ii) passes the OBDII portion of the I/M test;

(B) the original catalytic converter, or a replacement approved under this chapter is on the vehicle and functional; and

(C) the vehicle is in compliance with the applicable requirements of 40 C.F.R. 51.351, 40 C.F.R. Part 51 Subpart S, 40 C.F.R. Part 85, 40 C.F.R. Part 86, each as revised as of July 1, 1999, and the June 1, 1998 EPA guidance document entitled: Revision to Addendum to Mobile Source Enforcement Memorandum 1A (Revised Tampering Enforcement Policy for Alternative Fuel Conversions), adopted by reference in this chapter.

(2) retrofitted with a replacement gasoline engine as described in 18 AAC 52.050(i).

(b) No engine modification may be made unless the modification, and the parts used for that modification, are included on the list in Part V of the program manual.

(c) Tampering is prohibited. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144; am 1/1/00, Register 152; am 3/27/2002, Register 161; am 02/18/2006, Register 177)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

Editor's note: A copy of the Revision to Addendum to Mobile Source Enforcement Memorandum 1A (dated June 1, 1998) adopted by reference in 18 AAC 52.085, may be obtained from an implementing agency or at the department's Anchorage, Fairbanks, or Juneau offices. This document is also available from the Environmental Protection Agency (EPA), Office of Enforcement and Compliance Assurance, or from the EPA Air Enforcement Division.

18 AAC 52.090. REPAIR OF NONCONFORMING VEHICLES. (a) Based upon guidance issued by the implementing agency, the referee facility shall specify repair procedures for a vehicle that does not comply with the requirements of 18 AAC 52.075, 18 AAC 52.080, or 18 AAC 52.085.

(b) For a grey market vehicle, the implementing agency may require the repair of defective emissions control components, but motorists are not required to retrofit emissions control components that were not originally installed on the vehicle.

(c) The referee facility shall issue a certificate of inspection when a vehicle has been modified to comply with the requirements of 18 AAC 52.075, 18 AAC 52.080, or 18 AAC 52.085. (Eff. 2/1/94, Register 129; am 1/1/97, Register 140)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

Editor's note: 18 AAC 52.090 took effect 2/1/94 as an emergency regulation. Due to technical corrections made by the regulations attorney in reviewing the "permanent" regulation for filing, the permanent regulation as it was published in Register 130, July 1994, differed from the emergency regulation even though the section's history note did not reflect an amendment to that section.

18 AAC 52.095. MINIMUM CERTIFICATION REQUIREMENTS. (a) In addition to the other requirements of this chapter, to obtain department approval for an I/M program, an implementing agency shall meet the minimum requirements of this section.

(b) An implementing agency shall adopt training and testing procedures for certifying mechanics to perform I/M tests, repairs, and certification under this chapter. Procedures adopted under this subsection must be at least as stringent as those set out in 18 AAC 52.400 - 18 AAC 52.405.

(c) An implementing agency shall use only training courses for mechanics that have been certified by the department under 18 AAC 52.410.

(d) An implementing agency shall adopt procedures for certifying automotive repair facilities to participate in the I/M program as certified stations. Procedures for certification of stations must be at least as stringent as those set out in 18 AAC 52.415.

(e) An implementing agency shall adopt standards for certifying equipment for use in an I/M program approved under this chapter. Standards for certification of equipment must be at least as stringent as those set out in 18 AAC 52.420.

(f) An implementing agency shall adopt procedures for renewal of certifications issued by the agency. Procedures must be at least as stringent as those set out in 18 AAC 52.425.

(g) An implementing agency shall adopt procedures for monitoring certified mechanics and stations. Procedures must be at least as stringent as those set out in 18 AAC 52.440.

(h) An implementing agency shall adopt procedures for enforcing the I/M program and for revoking or suspending an I/M certification for violations of program requirements or procedures. Procedures adopted under this subsection must be equivalent to those set out in 18 AAC 52.100 and 18 AAC 52.105, including opportunity for notice, response, and an administrative hearing. (Eff. 2/1/94, Register 129; am 1/1/98, Register 144)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.100. ENFORCEMENT PROCEDURES FOR VIOLATIONS BY MOTORISTS. (a) To assist an implementing agency, the department will, in its discretion, participate in an enforcement action taken under this section by the implementing agency. The department will, in its discretion, take an enforcement action against a motorist who fails to comply with this chapter, with or without participation of the implementing agency.

(b) If good cause exists, the implementing agency shall investigate a claim that a requirement of this chapter has been violated by a motorist. If the implementing agency finds that a motorist has violated a provision of this chapter or of an I/M program administered under this chapter, the implementing agency may issue a notice of violation, advising that the motorist must respond to the implementing agency within the time period specified in the notice of violation or risk an enforcement action under (d) of this section. Nothing in this subsection requires a peace officer to issue a notice of violation before issuing a citation under an applicable statute, regulation or ordinance.

(c) The implementing agency shall allow a motorist who is issued a notice of violation the time period specified in the notice, after receipt of the notice, to provide to the agency with adequate proof that

(1) a vehicle registered outside an I/M area is not principally located or operated in an I/M area or used to commute into the Municipality of Anchorage;

(2) the vehicle has a valid waiver under 18 AAC 52.060 that was affixed to the windshield or displayed in a certificate holder in accordance with 18 AAC 52.020; or

(3) the vehicle has a valid certificate of inspection that was affixed to the windshield in accordance with 18 AAC 52.020.

(d) If a motorist receives a notice of violation under this section and fails to respond or provide appropriate proof of compliance with this chapter within the time period specified in the notice, the implementing agency may take one or more of the following enforcement actions:

(1) refer the matter for prosecution under AS 46.14.400(j);

(2) refer the matter for prosecution as a class A misdemeanor under AS 46.03.790;

(3) request the division of motor vehicles to revoke the vehicle's registration; and

(4) bring a civil action for pollution under AS 46.03.760(e). (Eff. 2/1/94, Register 129; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161; am 12/14/2006, Register 180)

Authority:	AS 46.03.010	AS 46.03.790	AS 46.14.400
	AS 46.03.020	AS 46.14.030	AS 46.14.510
	AS 46.03.760		

Editor's note: 18 AAC 52.100 took effect 2/1/94 as an emergency regulation. Due to technical corrections made by the regulations attorney in reviewing the "permanent" regulation for filing, the permanent regulation as it was published in Register 130, July 1994, differed from the emergency regulation even though the section's history note did not reflect an amendment to that section.

18 AAC 52.105. ENFORCEMENT PROCEDURES FOR VIOLATIONS BY CERTIFIED MECHANICS OR STATIONS. (a) If the department or an implementing agency finds, or has cause to believe, that an act or omission of a certified mechanic or an owner, operator, employee, partner, officer, or member of a certified station violates this chapter, the department will, in its discretion, or the implementing agency may investigate the alleged violation and take appropriate compliance action, civil or criminal, against the certified mechanic or certified station based on the nature and severity of the violation and the party's history of noncompliance. The department will, in its discretion, or the implementing agency may use an overt or covert performance review to investigate a certified mechanic or station. The department will, in its discretion, initiate the compliance action, including an overt or covert performance review, or participate in a compliance action taken by an implementing agency.

(b) Violations for which the department or an implementing agency might take action under (a) of this section include the following:

(1) an act or omission by a certified mechanic or an owner, operator, employee, partner, officer, or member of a certified station that causes the mechanic or station to be in violation of any applicable requirement of this chapter or the program manual;

(2) negligently providing incorrect or misleading information to the public regarding the requirements of this chapter or the program manual;

(3) causing or allowing a motorist to sign a work order that does not

(A) include the motorist's name and address;

(B) identify the vehicle by make, model, and model year;

(C) list all I/M-related work authorized by the motorist; or

(D) include the vehicle's odometer reading at the time of repair;

(4) failing or refusing to give a motorist a signed copy of any document requiring the motorist's signature;

(5) engaging in conduct that constitutes fraud, deceit, or gross negligence;

(6) failing to follow the inspection and repair procedures specified by the vehicle manufacturer or required by this chapter or the program manual;

(7) departing from or disregarding accepted trade standards for good and workmanlike repair in a manner that is prejudicial to another without the motorist's consent or the consent of the motorist's authorized representative;

(8) making false promises likely to influence, persuade, or induce a motorist to authorize the repair, service, or maintenance of a motor vehicle;

(9) entering false data into an EIS;

(10) performing or allowing a repair that is represented to the motorist as being required to remedy the cause of an inspection failure or obtain a certificate of inspection when it is not required;

(11) adjusting or modifying a vehicle subject to this chapter in a manner that would cause the vehicle to fail an I/M test; this conduct is prohibited regardless of when the vehicle is scheduled for an I/M test;

(12) charging for performing an I/M test that is represented to the motorist as being required, when it is not required;

(13) failing to maintain the confidentiality of a mechanic's access code for the EIS;

(14) allowing I/M-related repair work to be done by someone other than a certified mechanic without the motorist's consent;

(15) performing I/M repairs or performing an after-repair test on a vehicle described in 18 AAC 52.530(b) on which the certified station has not first performed an initial I/M test;

(16) testing a vehicle that is exempt from the requirements of this chapter under 18 AAC 52.005(f) or that is listed in 18 AAC 52.530(c);

(17) performing part of the emissions repairs required when there is an unavailability of replacement parts or an inability to correct certain emissions defects because of the limitations of a particular station; the only exceptions to this paragraph are

(A) if the referee facility has confirmed an availability of parts problem, or

(B) if the referee facility has confirmed that the vehicle has been repaired to the applicable repair cost minimum;

(18) failing to advise the implementing agency of any change in information provided in the mechanic's or station's application for certification or for renewal of certification;

(19) charging for the repair of defects covered by a warranty without the motorist's written consent;

(20) replacing a modified carburetor with an aftermarket or rebuilt carburetor, unless the replacement is certified by the manufacturer, the BAR, the CARB, or the EPA to meet the same specifications as the original equipment carburetor;

(21) using excessive time to inspect a vehicle during a performance review by the implementing agency; inspection time in excess of 60 minutes is considered excessive for the purposes of this paragraph unless due to circumstances beyond the control of the mechanic or station;

(22) failing to report to the implementing agency any illegal certification or other violation of this chapter;

(23) performing any type of prescreening; and

(24) performing an excessive amount of off-line tests; for purposes of this paragraph, “excessive” means that the number of off-line tests, excluding off-line tests that are a result of problems with either communication lines or the VID, is greater than 10 percent of the total number of on-line tests for any given period.

(c) As part of a compliance action, the department will, in its discretion, or the implementing agency may issue a notice of violation to the certified mechanic or station unless immediate action is warranted. If required by the department or implementing agency in the notice, the certified mechanic or station shall respond to the alleged violations in the time period specified in the notice.

(d) If the department or implementing agency determines that a violation exists and it is in the public interest to do so, the department will or the implementing agency shall modify, suspend, or revoke the certification of a mechanic or station. A compliance action under this section is subject to the following:

(1) if the department or implementing agency modifies, suspends, or revokes the certification of a mechanic or station, the department or implementing agency will send a notice to the mechanic or station stating that, based on the department’s or implementing agency’s written findings,

(A) the modification, suspension, or revocation is effective 30 days after the date of the notice or, at the discretion of the department or implementing agency, immediately if criminal misconduct is suspected;

(B) the certified mechanic or station may request an informal agency review under (3) of this subsection or a formal hearing under (4) of this subsection within 10 days after receiving the notice and that the certified mechanic or station may also request a stay of the modification, suspension, or revocation under (2) of this subsection within 10 days after receiving the notice; and

(C) a formal hearing, if requested, will be held within 60 days after the department or implementing agency receives a request for a hearing;

(2) if a stay is requested, the department will, in its discretion, or the implementing agency may, for good cause shown and upon reasonable conditions, stay the modification, suspension, or revocation of the certification for a reasonable time;

(3) an informal agency review under this subsection will be before the director of the division of the department that issued the notice, the director's designee, the local I/M administrator, or the local I/M administrator's designee, as applicable; the designee may not be the person who issued the notice; the review will be conducted as follows:

(A) within seven working days after receipt of a request for informal agency review, the person who would conduct the review shall decide if the request merits review;

(B) if the person who would conduct the review decides that the request does not merit review, the director of the division that issued the notice or the local I/M administrator, as applicable, shall inform the mechanic or station in writing of that decision and include the reasons for the decision; the denial shall include a statement that the mechanic or station may seek a formal hearing under (4) of this subsection;

(C) if the review is granted, the person who will conduct the review may request additional information from the mechanic or station; the person who conducts the review shall issue a final decision within 15 days after receipt of the request for review or receipt of additional information requested, whichever is later, and shall also advise the mechanic or station of the right to seek a formal hearing under (4) of this subsection;

(D) a mechanic or station that may seek a formal hearing under this paragraph must submit a hearing request within 15 days after a decision made under (B) or (C) of this paragraph is served on the mechanic or station; if requested, the formal hearing will be held within 60 days after the department or implementing agency receives the request for a hearing;

(4) a formal hearing under this subsection shall

(A) be before the commissioner or a person designated by the commissioner to hear the matter and prepare a recommended decision for the commissioner's review or before the local I/M administrator or a person designated by the administrator to hear the matter and prepare a recommended decision for the administrator's review, as applicable; and

(B) follow the hearing procedures of the Administrative Procedures Act (AS 44.62);

(5) after a formal hearing conducted by commissioner or the local I/M administrator under (4) of this subsection, the commissioner will or the local I/M administrator shall affirm, modify, or set aside the modification, suspension, or revocation of the certification;

(6) after a formal hearing conducted by a person designated by the commissioner or local I/M administrator to hear the matter and prepare a recommended decision under (4) of this subsection, the commissioner will or the local I/M administrator shall review the recommended decision and either affirm, modify, or set aside the modification, suspension, or revocation of the certification or return the recommended decision to the designated person for further proceedings, consideration, or recommendations;

(7) the commissioner will, in the commissioner's discretion, and the local I/M administrator may permanently revoke certification of a mechanic or station if to do so is warranted by the acts or omissions of the mechanic or station; and

(8) the decision of the commissioner or the local I/M administrator under (5), (6), and (7) of this subsection is a final agency decision.

(e) The department will, in its discretion, and an implementing agency may enter into a compliance order by consent with the certified mechanic or station to remedy the alleged violations rather than bring a compliance action or hold a hearing under (d) of this section if the certified mechanic or station agrees to waive its right to a hearing and review. If the department or an implementing agency determines that the mechanic or station has failed to timely implement the terms and conditions of the compliance order, the department will, in its discretion, or the implementing agency may start a compliance action to suspend, modify, or revoke the certification or refuse to renew a certification.

(f) If a certified mechanic or station voluntarily surrenders certification, the department will, in its discretion, or the implementing agency may take further civil or criminal enforcement action as appropriate.

(g) A mechanic or station whose certification is suspended or revoked under this section shall immediately surrender the certificate to the department or the implementing agency, as applicable, surrender all unused certificates of inspection to the implementing agency, and cease doing business as a certified mechanic or station. The implementing agency shall refund the money paid for unused certificates of inspection. The mechanic or station may not advertise that it is certified after its certification is suspended or revoked.

(h) If the owner or operator of a certified station conducts I/M tests at more than one place of business and the acts or omissions of the station warrant it, the commissioner will, in the commissioner's discretion, and the local I/M administrator may apply an action taken under this section to each such place of business in addition to the place of business as to which the action was taken.

(i) Unless the certification was permanently revoked under (c)(7) of this section, a mechanic or station whose certification was modified, suspended, or revoked may apply for recertification at any time. In addition to meeting the applicable requirements of 18 AAC 52.400 - 18 AAC 52.440, the mechanic or station must provide evidence that the mechanic or station has taken adequate corrective action and has taken action necessary to avoid a reoccurrence of the violation. The department will, in its discretion, and the implementing agency may refuse to renew the certification of a mechanic or station that fails either to take adequate corrective action or to take action necessary to avoid a reoccurrence of the violation. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152)

Authority:	AS 46.03.010	AS 46.14.030	AS 46.14.510
	AS 46.03.020		

18 AAC 52.110. ENFORCEMENT PROCEDURES FOR VIOLATIONS BY CERTIFIED EQUIPMENT MANUFACTURER. (a) If the department or an implementing agency finds or has cause to believe that a certified equipment manufacturer or a designated service contractor of a certified equipment manufacturer is not providing service or maintenance consistent with the equipment manufacturer's certification under 18 AAC 52.420, the department will, in its discretion, or the implementing agency may investigate the alleged violation. If the implementing agency finds or has cause to believe that a violation exists, the implementing agency shall refer the matter to the department for further action. The department will, in its discretion, take an appropriate civil or criminal compliance action based on the nature and severity of the violation and the history of noncompliance by the equipment manufacturer or the designated service contractor.

(b) Violations for which the department might take compliance action under (a) of this section include the following:

(1) lack of a designated service provider located within this state;

(2) failure to respond within three working days from the time a service call is made for service or maintenance of an EIS within an I/M area;

(3) failure to complete all on-site repairs of an EIS within five working days from the time a service or maintenance request is made;

(4) failure to provide an on-call service technician consistent with the equipment manufacturer's certification under 18 AAC 52.420;

(5) failure to provide a call-in system and procedures for an EIS owner to either contact a service technician or place a service request that are consistent with the equipment manufacturer's certification under 18 AAC 52.420;

(6) failure to provide software updates for an EIS within the time frame specified by the department under this chapter or the program manual;

(7) failure to bring non-compliant EISs in the field into compliance with the analyzer system specifications set out in the program manual within the time frame requested by the department or in a way that is satisfactory to the department;

(8) violation of an applicable requirement of this chapter or the program manual; and

(9) conduct that constitutes fraud, deceit, or gross negligence.

(c) As part of a compliance action, the department will, in its discretion, issue a notice of violation to the certified equipment manufacturer or the designated service contractor unless immediate department action is warranted. If required in the notice of violation, the certified equipment manufacturer or the designated service contractor shall respond to the alleged violation within the time specified in the notice.

(d) If the department determines that a violation exists and it is in the public interest to do so, the department will modify, suspend, or revoke an equipment manufacturer's certification. A compliance action under this section is subject to the following:

(1) if the department modifies, suspends, or revokes an equipment manufacturer's certification, the department will send a notice to the manufacturer and, if applicable, the designated service contractor stating that, based on the department's written findings,

(A) the modification, suspension, or revocation is effective 30 days after the date of the notice;

(B) the manufacturer or the service contractor may request an informal agency review under (3) of this subsection or a formal hearing under (4) of this subsection within 10 days after receiving the notice and that the manufacturer or service contractor may also request a stay of the modification, suspension, or revocation under (2) of this subsection within 10 days after receiving the notice; and

(C) a formal hearing, if requested, will be held within 60 days after the department receives a request for a hearing;

(2) if a stay is requested, the department will, in its discretion, for good cause shown and upon reasonable conditions, stay the modification, suspension, or revocation of the certification for a reasonable time;

(3) an informal agency review under this subsection will be before the director of the department division that issued the notice or the director's designee; the designee may not be the person who issued the notice; the review will be conducted as follows:

(A) within seven working days after receipt of a request for an informal agency review, the person who would conduct the review shall decide if the request merits review;

(B) if the person who would conduct the review decides that the request does not merit review, the director of the division that issued the notice shall inform the manufacturer or service contractor in writing of that decision and include the reasons for the decision; the denial shall include a statement that the manufacturer or service contractor may seek a formal hearing under (4) of this subsection;

(C) if the review is granted, the person who will conduct the hearing may request additional information from the manufacturer or service contractor; the person who conducts the review shall issue a final decision within 15 days after receipt of the request for review or receipt of additional information requested, whichever is later, and shall also advise the manufacturer or service contractor of the right to seek a formal hearing under (4) of this subsection;

(D) a manufacturer or service contractor that may seek a formal hearing under this paragraph must submit a hearing request within 15 days after a decision made under (B) or (C) of this paragraph is served on the manufacturer or service contractor; if requested, the formal hearing will be held within 60 days after the department receives the request for a hearing;

(4) a formal hearing under this subsection shall

(A) be before the commissioner or a person designated by the commissioner to hear the matter and prepare a recommended decision for the commissioner's review; and

(B) follow the hearing procedures of the Administrative Procedures Act (AS 44.62);

(5) after a formal hearing conducted by commissioner under (4) of this subsection, the commissioner will affirm, modify, or set aside the modification, suspension, or revocation of the certification;

(6) after a formal hearing conducted by a person designated by the commissioner to hear the matter and prepare a recommended decision under (4) of this subsection, the commissioner will review the recommended decision and either affirm, modify, or set aside the modification, suspension, or revocation of the certification or return the recommended decision to the designated person for further proceedings, consideration, or recommendations; and

(7) the decision of the commissioner under (5) and (6) of this subsection is a final agency decision.

(e) The department will, in its discretion, enter into a compliance order by consent with the equipment manufacturer or designated service contractor to remedy the alleged violations rather than bring a compliance action and hold a hearing under (d) of this section if the manufacturer or service contractor agrees to waive its right to a hearing and review. If the department determines that a certified equipment manufacturer or a designated service provider has failed to timely implement the terms and conditions of a compliance order, the department will, in its discretion, start a compliance action to suspend, modify, or revoke the certification or refuse to renew a certification.

(f) If a certified equipment manufacturer voluntarily surrenders certification, the department will, in its discretion, take further civil or criminal enforcement action as appropriate.

(g) An equipment manufacturer whose certification has been modified, suspended, or revoked may apply for recertification at any time. In addition to meeting the applicable requirements of 18 AAC 52.420, the equipment manufacturer's application must include evidence that the manufacturer has taken adequate corrective action and has taken action necessary to avoid a reoccurrence of the violation. (Eff. 1/1/2000, Register 152)

Authority:	AS 46.03.010	AS 46.14.030	AS 46.14.510
	AS 46.03.020		

ARTICLE 2. CENTRALIZED PROGRAM REQUIREMENTS

(Reserved)

ARTICLE 3. DECENTRALIZED PROGRAM REQUIREMENTS.
(Reserved)

ARTICLE 4. CERTIFICATION REQUIREMENTS.

Section

18 AAC 52.400. MECHANIC CERTIFICATION. (a) A mechanic who seeks certification under this chapter shall submit an application to the implementing agency on a form provided by the agency. The implementing agency may issue a certification to a mechanic if that mechanic has

(1) at least two years experience in the automotive repair industry, or equivalent educational experience;

(2) successfully completed a certified training course in vehicle inspection and repair procedures; for purposes of this paragraph, a "certified training course" is one that has been certified under 18 AAC 52.410; and

(3) passed an examination that has been approved under 18 AAC 52.405; for purposes of this paragraph, a passing score is 80 percent or above.

(b) Regularly scheduled examinations shall be held at a place and time designated by the implementing agency. The agency shall publish the dates and locations for taking the examination. An applicant who fails the examination may, after at least 30 days, apply for re-examination.

(c) The mechanic competency portion of the examination may be given as a screening or challenge test for competency in the area of emissions control system maintenance and repair. A person who passes the screening test may be certified after passing an abbreviated training course that emphasizes the details of the I/M program requirements and procedures and successfully completing the hands-on proficiency portion of the training course described in (a)(2) of this section.

(d) If a mechanic includes with the application

(1) a certificate of successful completion of a training course certified under 18 AAC 52.410, the implementing agency may waive the competency test described in 18 AAC 52.405(b), and issue certification after the mechanic successfully completes the rules and regulations and the hands-on portions of the examination described in 18 AAC 52.405(a); or

(2) a current certification issued under this chapter by another implementing agency, the implementing agency will not require the mechanic to take a competency test, but will require successful completion of the rules and regulations and the hands-on tests.

(e) Certification under this section is valid for two years and may be renewed under 18 AAC 52.425. The implementing agency may issue a one-year certification to a mechanic who has received the training and passed the tests described in (a)(2) and (3) of this section, but who does not meet the criteria listed in (a)(1) of this section.

(f) A mechanic certified under this section may perform I/M tests and emission-related repairs as described in this chapter and the program manual.

(g) An applicant who requires additional time to complete the examination shall notify the implementing agency at least 10 days in advance so that special testing arrangements can be made. The implementing agency will make appropriate accommodations as required by the Americans with Disabilities Act, including special testing accommodations for persons unable to take the standard examination. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.405. CERTIFIED MECHANIC EXAMINATIONS. (a) Only an examination certified under this section may be used for purposes of certifying mechanics under 18 AAC 52.400. To be certified under this section, the examination must consist of

(1) a comprehensive mechanic competency test described in (b) of this section;

(2) a written test with a test time of approximately one hour, with the test to cover applicable regulations, the written test may be given to a mechanic only after the mechanic has attended a lecture and a question and answer period of up to eight hours; the written test must cover all requirements of this chapter, with emphasis on certification of mechanics and stations, tailpipe emissions standards, waiver procedures, quality control, program administration, and enforcement; and

(3) a hands-on proficiency test of approximately 30 minutes duration.

(b) Approximately three hours must be allowed to complete the competency test required by (a)(1) of this section, with approximately the first half-hour for orientation and instructions. At least two and one-half hours must be scheduled for the written competency examination. The competency examination must cover

(1) basic internal combustion gasoline engine operation;

(2) fuel systems, OBDII systems, and emissions control devices; and

(3) engine diagnosis and test equipment operation. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144; 3/27/2002, Register 161)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.410. TRAINING COURSE CERTIFICATION. (a) Only a training course certified under this section may be used for purposes of certifying mechanics under 18 AAC 52.400. The department will, in its discretion, certify a mechanic's training course if minimum course requirements are equivalent to those contained in Part II of the program manual.

(b) A person seeking certification for a training course under this section shall submit to the department:

(1) a detailed course outline;

(2) a written explanation of how the proposed course compares to the minimum course requirements in Part II of the program manual;

(3) a complete copy of course materials to be used, including workbooks, textbooks, and visual aids;

(4) a description of the facilities available for classroom training;

(5) a detailed description of facilities to be used for hands-on training and testing, including a list of available equipment;

(6) a copy of a typical final examination to be given at the completion of the course work and a description of the grading criteria;

(7) a description of the manner in which the integrity of the examination process will be protected; and

(8) a resume for each instructor, including proof that the instructor has current National Institute for Automotive Service Excellence (ASE) L-1 certification and has successfully completed the training course certified under this section or an equivalent course as determined by the department.

(c) Before certifying a training course under this section, the department will, in its discretion, require

(1) an interview with one or more instructors who will be teaching the course; and

(2) a site visit to inspect the facilities to be used for the hands-on training.

(d) The department will issue certification under this section if it finds that students who pass the proposed training course will be capable of accurately following repair procedures set out in Part IV of the program manual.

(e) Use of instructors not identified under (b)(8) of this section, or any other change in the course as certified, requires prior department approval and an amended certification.

(f) Certification for a training course is valid for two years, and must be renewed under 18 AAC 52.425.

(g) After notice and opportunity for hearing, the department will, in its discretion, revoke certification if the course is not being conducted consistent with the description and information provided under (b) of this section. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/2000, Register 152; am 02/18/2006, Register 177)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.415. I/M STATION CERTIFICATION. (a) An implementing agency may certify an auto repair facility as a certified station if the facility meets the requirements of 18 AAC 52.500 - 18 AAC 52.550. Separate certification is required for each inspection location. Multiple test bays or inspection lanes at one location require a single certification. Each certification is valid for a single address. A mobile station may not be certified under this chapter.

(b) A person who seeks certification shall submit an application to the implementing agency on a form provided by the implementing agency. The person shall submit a separate application for each inspection location.

(c) The applicant shall include in the application

(1) the business name under which the station will be operated;

(2) if the station will be operated as a partnership, each partner's name, address, telephone number, and Alaska driver's license number or the number of the state identification card issued by the division of motor vehicles under AS 18.65.310;

(3) each officer's name, title, address, and telephone number, if the station will be operated as a corporation; in addition, the application should include the name, address, and telephone number of the corporation's registered agent, and a copy of a board resolution authorizing operation as a certified station;

(4) the name of the person supervising each location in the I/M area;

(5) the names and certification numbers of all certified mechanics employed by the applicant;

(6) all equipment and supplies that the applicant intends to have on premises to meet the requirements of 18 AAC 52.500 - 18 AAC 52.550; and

(7) the telephone number of each dedicated line provided for each EIS.

(d) The owner or operator of a certified station shall report any change in the information provided in an application under this section to the implementing agency within 10 days after the change occurs.

(e) After receipt of a properly completed application, the implementing agency shall determine whether the information submitted is valid and sufficient to warrant certification. The implementing agency may conduct an onsite inspection of the proposed facility to determine whether the necessary equipment is present and in proper operating condition.

(f) Certification under this section is valid for two years unless

(1) Repealed 1/1/98.

(2) certification is suspended or revoked under 18 AAC 52.105. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144; am 1/1/2000, Register 152)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.420. EQUIPMENT CERTIFICATION. (a) A manufacturer or distributor of emissions test equipment may apply to the department for certification of that equipment for use under this chapter. A person who seeks certification of equipment for use in this state under this chapter shall provide EISs that are an Alaska version of the BAR 97-certified EIS or equivalent. The EIS must be modified to meet the specifications set out in Part I of the program manual. The application must include

(1) the following for California certified hardware:

(A) evidence that the EIS hardware has been certified by the BAR;

(B) all applicable BAR certifications issued for the hardware;

(C) all documentation submitted to the BAR as part of the hardware certification process, including details on the certified hardware configuration; and

(D) a sworn statement by the applicant that the BAR has not revoked certification and that the hardware configuration of the Alaska EIS is identical to that certified by the BAR except as specified in Part I of the program manual;

(2) the following for an EIS equivalent to the California certified BAR 97:

(A) evidence, such as test data, or description of another application or situation in which the hardware has been used; and

(B) evidence that documents the hardware has achieved a level of performance equal to or better than that required under BAR 97 certification;

(3) documentation that the Alaska version of the BAR 97-certified EIS or equivalent operates in a manner consistent with the inspection requirements, the EIS use examples, and the emissions standards contained in Part IV of the program manual

(4) the specific display prompts and programming of the EIS as set out in Part I of the program manual, including a printed representation of all screen displays that a technician might encounter when using the EIS;

(5) a certified statement that the EIS has been designed to meet the requirements of Part I of the program manual;

(6) an instruction manual for the EIS satisfying the requirements of Part I of the program manual;

(7) a certification signed by an authorized company representative that includes:

(A) a statement that the applicant will provide or arrange for service and maintenance and that addresses

(i) lock-out correction;

(ii) service providers located in this state;

(iii) response time of three days or less from the time a service call is made from any I/M area in this state to provide the service;

(iv) completion of all on-site repairs within five working days from the time the service call is made;

(v) providing a loaner EIS should the analyzer be unrepairable within five working days from the time the service call is made;

(vi) an on-call service technician Monday through Saturday; and

(vii) a 24 hour call-in system and procedures that allow an EIS owner to contact the service technician or place a service call; and

(B) a full description of applicable warranty provisions including

(i) service response time and local or toll-free service contact phone number; and

(ii) a certified copy of the warranty form that will be presented to prospective purchasers and provided with all EISs sold in this state;

(8) a year 2000 compliance statement;

(9) Underwriters Laboratory (UL) or other approved certifications for all system hardware;

(10) a statement that the applicant warrants that each EIS will be free from defects in materials or workmanship as required in Part I of the program manual;

(11) a statement that the applicant will provide a software update of up to 750 programming hours at no cost for development or installation and that additional software updates necessary to comply with revisions to the requirements of Part I of the program manual will be made by the applicant within six months after receiving a notice from the department that a software revision is necessary;

(12) a statement that the applicant will provide two EISs for evaluation by the department or its designee as required by (b) of this section;

(13) a statement that the applicant recognizes that successful completion of the evaluation under (b) of this section does not relieve the applicant from any software warranty requirements;

(14) a description of the service technician access security system the applicant has implemented in EISs to be sold in this state; the pages of the application describing the security system shall be marked CONFIDENTIAL and kept separate from the rest of the application;

(15) documentation that demonstrates the ability of the EIS to communicate with the VID and evidence that the EIS can interface for all EIS-VID information interfaces as described in Part 1 of the program manual; and

(16) a statement that the applicant will pay all reasonable costs incurred by the department in excess of $20,000 in its evaluation of the EIS for consistency with the requirements of this chapter and the program manual.

(b) An applicant for certification under this section shall submit two EISs for evaluation by the department or its designee. The applicant will be given the opportunity to correct minor discrepancies without the need for re-evaluation. Upon certification, the applicant shall transfer ownership of the two EISs to the department.

(c) The department will certify an EIS that meets the requirements of Part I of the program manual and this section.

(d) Annual renewal of certification under 18 AAC 52.425 is required. Renewal of certification will be approved upon a determination by the department that the applicant has complied with any software update requirements imposed under this section or Part I of the program manual and with all service and maintenance requirements identified under (a)(7)(A) of this section and has not committed a violation for which the department might take a compliance action as described at 18 AAC 52.110(b).

(e) Certification of an EIS may be modified, suspended, or revoked under 18 AAC 52.110 if the department determines that the EIS does not fully comply with all portions of the analyzer specifications set out in Part I of the program manual or that the manufacturer has committed a violation for which the department might take compliance action as described at 18 AAC 52.110(b).

(f) The department will, in its discretion, limit suspension or revocation of the certification for an EIS to future sales of that EIS. EISs in service at the time the department imposes a limited suspension or revocation that do not conform to analyzer and update specifications will be locked out until they are brought into compliance at the discretion of the department. If the department limits the suspension or revocation of an EIS to future sales, the department will notify all certified stations and other representatives of the repair industry that the certification of that EIS has been suspended or revoked for EISs put into service after the date of the suspension or revocation. If problems identified are not corrected within the time specified by the department, the department will, in its discretion, suspend or revoke certification for all EISs affected, including those EISs in service at the time of the initial suspension or revocation. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144; am 1/1/2000, Register 152)

Authority:	AS 44.46.025	AS 46.14.030	AS 46.14.510
	AS 46.03.020		

18 AAC 52.425. RENEWAL OF CERTIFICATION. (a) A person who has received certification under 18 AAC 52.400 - 18 AAC 52.420 shall apply for renewal on a form provided by the implementing agency. An application for renewal must be filed at least 30 but no more than 90 days before certification expires.

(b) Renewal of certification of a training course approved under 18 AAC 52.410 requires revisions to the course to accommodate changes in the I/M program.

(c) A certified mechanic's certification expires on its expiration date unless the mechanic renews certification under this section. To renew an I/M mechanic certification, a mechanic must pass a recertification examination. The mechanic shall bring a renewal application and the mechanic's current certification to the recertification examination. To be recertified, the mechanic must pass a written test and a hands-on proficiency test with a score of 80 percent or higher. The written test must be equivalent to the examination described under 18 AAC 52.405 and must include sections on mechanic competency and I/M program regulations.

(d) The department will, in its discretion, approve an alternate method of recertification in an implementing agency's design document if the implementing agency demonstrates that the alternate method will assure that a mechanic recertified under that method will be qualified to carry out the requirements applicable to certified mechanics under this chapter.

(e) A mechanic may act as a certified mechanic for purposes of this chapter only while holding a valid, current certification. If a mechanic fails to renew the certification before it expires, that mechanic is prohibited from performing any activity requiring certification under this chapter.

(f) The implementing agency may inspect a certified station before renewing the station's certification. An applicant for renewal shall meet all conditions required for initial certification under 18 AAC 52.415. If certification has expired, the applicant for recertification may not perform an I/M test until recertification is approved. It is the owner's or operator's responsibility to know when the certification expires and to complete the renewal process before certification expires.

(g) The implementing agency may refuse to renew certification

(1) if the application is inadequate or inaccurate, or if the applicant has had a certification suspended or revoked under this chapter; or

(2) of a training course if the course is shown to be inadequate to ensure that students will be able to accurately follow repair procedures equivalent to those in Part IV of the program manual. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.430. DUTY TO REPORT CHANGE IN STATUS. A certified mechanic or station shall report to the implementing agency any change in the I/M-related status, including a change in employment or in the home or mailing address, within 10 days after the change occurs. (Eff. 2/1/94, Register 129)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.440. MONITORING OF CERTIFIED MECHANICS AND STATIONS. (a) The implementing agency shall conduct routine performance reviews of certified mechanics and stations and shall send vehicles used for overt and covert performance reviews through a certified station to determine whether proper inspections and repairs are being performed. The implementing agency may

(1) perform other inspections, conduct quality control checks, and otherwise monitor mechanic and station performance; and

(2) contract for the analysis of data received from certified stations, and for other assistance.

(b) The implementing agency may direct its referee facility to

(1) alter a vehicle's emissions control system for the purposes of creating an intentional emissions problem that should be readily identifiable by a certified mechanic or station during an overt or covert performance review of the mechanic or station;

(2) verify and document any alteration made under (1) of this subsection, including the status of the vehicle's emissions control system and emissions levels, before the vehicle is taken to the certified station for the performance review; and

(3) determine the results of emissions repairs made on a documented vehicle at the certified station.

(c) After the overt or covert performance review, the implementing agency shall give the certified station a copy of the description of any alteration made by the referee facility under (b)(1) of this section.

(d) A certified station may not charge for an overt performance review conducted under this chapter.

(e) The owner, operator, or an employee of the station shall allow a representative of the implementing agency to

(1) have immediate access to the station during normal business hours;

(2) observe all activities related to I/M testing and repair of vehicles under this chapter; and

(3) have reasonable access to records, including certificates, invoices, work orders, VIRs, estimates, and other documents related to the I/M program.

(f) Except when a test or repair using the EIS is in progress, the owner or operator of a certified station, or a certified mechanic, shall provide immediate access to the EIS so that a representative of the implementing agency may perform any check, reprogramming, disk change, or other system-related inspection, modification, or service. If a test or repair is in progress, the owner, operator, or mechanic shall provide access to the EIS when the test or repair is completed, or within one hour of the request for access, whichever first occurs. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144; am 1/1/2000, Register 152)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.445. SUSPENSION OR REVOCATION OF CERTIFICATION. A certified mechanic or station found by the implementing agency to be in noncompliance with a requirement of this chapter risks suspension or revocation of certification under 18 AAC 52.105. (Eff. 2/1/94, Register 129)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

ARTICLE 5. CERTIFIED STATION REQUIREMENTS.

Section

18 AAC 52.500. GENERAL OPERATING REQUIREMENTS. (a) No person or business may post a sign or otherwise advertise a facility as a certified station or solicit or offer to perform an I/M test if that person or business is not certified under this chapter. The owner or operator of a certified station shall employ only certified mechanics to perform emissions repairs and inspections required under this chapter. The owner or operator shall ensure that all equipment is properly maintained and calibrated and that any repair or inspection subject to this chapter is done as required by the vehicle manufacturer, this chapter, and the program manual, including

(1) ensuring that each EIS has been certified under 18 AAC 52.420;

(2) following, and requiring mechanics employed by the station to follow, the testing procedures and meeting the inspection standards set out in Part IV of the program manual; and

(3) using only original equipment manufacturer's parts, aftermarket parts that meet original equipment manufacturer specifications, or the aftermarket parts authorized for use in Part V of the program manual.

(b) The owner or operator of a certified station shall ensure that the certified station

(1) is constructed and equipped to comply with applicable federal, state, and local requirements;

(2) is heated and cooled as necessary to

(A) maintain the temperature at the operating range specified for the EIS by the EIS manufacturer; and

(B) prevent excessive temperature fluctuations;

(3) provides 110-120 volt power for the EIS from an approved source of electricity that

(A) supplies a consistent source of electricity; and

(B) enables the EIS to meet or exceed the minimum operating requirements for the analyzer;

(4) provides adequate ventilation for exhaust gases; and

(5) is equipped with a separate telephone line for each EIS that is connected to the EIS at all times.

(c) The owner or operator shall ensure that I/M tests and other work subject to the requirements of this chapter are performed only at the certified location.

(d) Upon request, the certified station shall return a replaced part to the motorist after repair work is completed, except a part required to be returned to the manufacturer or distributor under a warranty or exchange arrangement. If a part must be returned to the manufacturer or distributor, the station shall first give the motorist an opportunity to inspect the part.

(e) Except as otherwise provided in this subsection, if a certified mechanic or station elects not to do further work on a vehicle, the mechanic shall remove, at no cost to the motorist, any parts that were installed, and shall refer the motorist to the referee facility. If the mechanic has properly performed the correct repairs, the station may charge the motorist for the repair, refer the vehicle to the referee facility, and agree to comply promptly with the decision and instructions of the referee facility.

(f) If a certified station cannot accurately test a vehicle, the station shall refer the vehicle to another certified station. If a certified station cannot competently repair a vehicle, the station may refer the vehicle to another certified station or to a noncertified repair facility. If the certified station refers a vehicle to a noncertified repair facility for I/M-related repairs, the owner or operator of the certified station must fully inform the motorist of all rights, privileges, and advantages that the motorist might lose if repairs are performed at a noncertified facility.

(g) A certified mechanic or station shall inform each motorist that the vehicle must be registered with DMV within 90 days after a certificate of inspection is issued, and that failure to register the vehicle within 90 days will require the motorist to obtain a new certificate of inspection and to pay for another test. If the motorist requests an I/M test for a vehicle with a registration due date more than 90 days in the future, the mechanic or station shall obtain the motorist's signature on an acknowledgment that the motorist was informed of the 90-day limit. The mechanic or station shall secure authorization as follows:

I acknowledge notice that I must register my vehicle with DMV within 90 days after a certificate of inspection is issued, or obtain a new certificate of inspection if I have not registered the vehicle before the 90 days have passed. I understand that I would have to pay to have my vehicle inspected again in order to receive the new certificate.

___________ ______
(signature) (date)

(h) A certified mechanic shall inform the motorist that emissions defects that are not caused by tampering might be covered by warranty and that the motorist may take the vehicle to the referee facility for inspection before having repairs performed or to the manufacturer's representative for inspection and repairs.

(i) A motorist may elect to bypass the referee facility under (h) of this section. The motorist may go directly to the warranty repair facility or may pay to have the repairs performed at a repair facility of the motorist's choice. The implementing agency will not be able to offer assistance if the results are not satisfactory. If the repair facility is a certified station, another initial test, at the motorist's expense, is required on the vehicle before the repair.

(j) Each certified station shall document to the implementing agency those motorists who are referred to the referee facility for warranty verification. Documentation must be in the following language, signed by the motorist:

I acknowledge that I have been referred to the referee facility by [insert name of person who made the referral].

_________________________ ________
(signature) (date)

(Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144; am 1/1/2000, Register 152)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.505. DISPLAY OF CERTIFIED STATION SIGN. (a) Only a station certified under this chapter may display a sign or shield bearing the inscription "Certified I/M Station, Test and Repair." The sign must conform to the design shown in Figure 1 and must be bordered and lettered in light chrome yellow. The background must be royal blue. The word "CERTIFIED" must be in 2 ¼ inch high gothic letters at the top of the sign. "I/M" must appear where indicated in Figure 1 in four-inch high gothic letters below the word "CERTIFIED". The word "STATION" must appear where indicated in Figure 1 in 2 ¼ inch high gothic letters below "I/M". The words "TEST AND REPAIR" must appear on two lines at the bottom of the sign in

1 ½ inch high gothic letters. All dimensions of the sign may be increased or decreased in uniform proportion.

Figure 1
Certified I/M Station Sign

(b) A certified station is not required to display the official I/M shield, but the following terms are reserved and may appear only on an official shield:

(1) "certified I/M station";

(2) "certified";

(3) "test and repair"; and

(4) repealed 6/24/94;

(5) "testing station". (Eff. 2/1/94, Register 129; am 6/24/94, Register 130)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.510. DISPLAY OF CERTIFICATION. A certified station shall prominently display in the customer service area each certification issued under this chapter for that station and for each certified mechanic employed by the station. The certifications must be displayed in a manner that is legible by customers while a work order is being completed. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/2000, Register 152; am 02/18/2006, Register 177)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.515. INSPECTION CHARGES. (a) A certified station shall post in its customer service area a clearly legible sign that states

(1) the total cost for an I/M test, pass or fail; or

(2) the cost for an I/M test and the cost for a certificate of inspection, if the vehicle passes the inspection, with each cost listed separately.

(b) If different inspection charges are imposed for different vehicles or circumstances, each separate charge must be posted.

(c) In addition to posting inspection charges, the station shall complete and provide each motorist with a cost quotation for the I/M test and issuance of a certificate of inspection. The quotation must be made by an employee of the station and agreed to by the motorist before an I/M test is conducted.

(d) The mechanic or station shall ensure that the motorist is

(1) advised that the

(A) inspection cost covers only the inspection of the vehicle and, if the vehicle

(i) passes the inspection, the certificate of inspection; or

(ii) fails the inspection, the cost of preparing a written repair estimate except as provided in (e) of this section;

(B) cost of any necessary repairs are not included in the inspection cost; and

(2) given a written itemized repair cost estimate, as described in (e) of this section, if the vehicle fails the inspection, and advised that

(A) another facility may perform the repairs;

(B) an additional inspection fee may be charged if the vehicle is taken to another certified facility for repairs; and

(C) there is no charge for an after-repair test if the repairs are performed at the station that performed the initial test.

(e) Unless the implementing agency provides otherwise, after a failed test, the certified station shall give the motorist a written repair estimate for all necessary I/M repair work that separately lists the cost of performing the labor and the cost of providing the parts. A written repair estimate

(1) Repealed 1/1/2000.

(2) may be prepared after preparing an initial estimate for the cost of performing a recognized diagnostic procedure if that procedure is needed to determine the exact repair required; for purposes of this paragraph, "recognized diagnostic procedure" means a procedure listed in a current emissions control repair manual approved by an implementing agency under 18 AAC 52.520(b);

(3) may not be an open-ended estimate;

(4) must state the maximum amount to be charged for each repair or procedure;

(5) must be created by the certified station as part of the I/M test, and the cost of the estimate must be included as part of the cost of the test;

(6) may be based upon the cost of original equipment manufacturer (OEM) parts and repair procedures if the estimate is for repair of a vehicle that is covered by a manufacturer's warranty; and

(7) must reflect the least costly repair procedures available that satisfy the requirements of this chapter if the estimate is for repair of a vehicle that is not covered by a manufacturer's warranty; the motorist may specify a repair procedure that costs more than the repair procedure specified in the certified station's estimate, but if the motorist specifies a more costly repair procedure, the cost of the repairs that exceeds the certified station's written repair estimate based on the least costly repair procedure may not be applied to satisfy the repair cost minimum.

(f) No work may be done and no charges may accrue until authorized by the motorist. No charge may be made for work done or parts supplied in excess of the estimate without the motorist's oral or written consent. For an oral consent, a station employee shall enter on the work order or invoice the date, time, name of the person who authorized the additional repairs, telephone number, if any, and a detailed summary of the additional parts, labor, and total additional cost. After completion of repairs, a station employee shall request the motorist to sign a notice and consent form in the following language:

> I acknowledge notice and my oral approval of an increase in the original estimated price.
>
> ______________________
> (customer's signature)

(g) The certified station shall include in the written estimate a statement of any specialized automotive repair service that, if required to be done, will be done by another person. The station is responsible for this specialized, subcontracted service in the same manner as if the station or its employees had done it. No service may be done by someone other than the certified station without the motorist's consent. Unless the implementing agency requires otherwise, the station shall obtain the motorist's consent as follows:

> I acknowledge notice and approval of the subcontracted inspection and repairs indicated above.
>
> ______________________ ______
> (signature) (date)

(h) If the motorist's consent for a subcontracted repair is oral, a station employee shall make a notation on the work order of the date, time, name of person authorizing the subcontracted repair, telephone number called, if any, a description of each subcontracted repair to be performed, and the cost of parts and labor for each repair. Unless the implementing agency requires otherwise, after the repair work is completed, the station employee shall request the motorist to sign the following statement:

> I acknowledge notice and oral approval of the subcontracted inspection and repairs indicated above.
>
> ____________________ _______________
> (signature) (date)

(i) If the motorist authorizes subcontracted repairs under (g) or (h) of this section, an employee of the certified station shall deliver the vehicle or part to be repaired to the subcontractor and retrieve the vehicle or part after the repairs are completed. The certified station shall then perform an after-repair I/M test. The owner or operator of the certified station shall pay the subcontractor and the motorist shall pay the certified station for the repair.

(j) A certified station may not charge a fee, and shall give the motorist a work order or invoice marked "no charge," for the following work:

(1) an inspection performed by a certified station after repairs have been performed on a vehicle at that station;

(2) repealed 1/1/2000.

(3) an inspection of a vehicle under an overt performance review;

(4) an aborted test, unless the test was requested by the customer for purposes other than obtaining a certificate of inspection;

(5) an inspection performed when no estimate was provided to the motorist;

(6) a second I/M test after the motorist has been referred to the referee facility or to the dealer on a recall advisory;

(7) repealed 3/27/2002;

(8) an I/M test on a vehicle that fails the test if the station cannot repair that vehicle within a reasonable period;

(9) the repair of defects covered by a warranty unless the repair is requested by the motorist at a facility other than an authorized warranty repair facility;

(10) any emissions-related repair made to the vehicle before the initial I/M test, unless allowed by an implementing agency; and

(11) any emissions-related repair made to a vehicle with a registration that will expire in less than 90 days unless the vehicle has been inspected and a repair estimate has been prepared.

(k) If the cost quotation issued under this section includes a free or reduced-charge I/M test with the purchase of some other service, the certified station shall provide the motorist with a complete I/M test before providing or charging for the other service. If the vehicle fails, the station shall perform a complete I/M test and provide the motorist with all other required documents before providing or charging for the originally advertised additional service.

(*l*) Repealed 1/1/2000. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161; am 02/18/2006, Register 177)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.520. REQUIRED TOOLS AND EQUIPMENT. (a) A certified station shall have available for use by its employees, the tools and test equipment necessary to conduct vehicle I/M tests, including at least one EIS certified under 18 AAC 52.420. If a vehicle manufacturer specifies that special tools or testing equipment must be used to perform certain repairs on certain vehicles, the station shall have that equipment, or its equivalent, available when those repairs are performed on those vehicles. The requirements of this subsection do not preclude specialty subcontracted repairs, with the customer's consent.

(b) The owner or operator of a certified station shall keep on the premises a current copy of this chapter, the I/M program manual, updates to the manual, and all other documents required by the implementing agency, and shall make those documents available to the certified mechanics employed by the station. The owner or operator shall maintain a library of current emissions control repair manuals approved by the implementing agency (such as Motor Emission Control Manuals, Chilton Emission Control Manuals, Mitchell Emission Control Manuals, Mitchell Engine Performance Manuals, Mitchell Light Truck and Van Service Manuals, and Mitchell Passenger Car Service Manual (for 1989 only), or a computerized version of these manuals) for use with each imported and domestic passenger car or light-duty truck included in the I/M program.

(c) In addition to the requirements of (a) and (b) of this section, the owner or operator of a certified station shall have on site all tools and equipment necessary for emissions-related I/M tests and repairs, including, at a minimum, the equipment listed in this subsection for use by certified mechanics for each vehicle make and model that the station repairs. The owner or operator shall keep the equipment operational and well-maintained. The meters, gauges, and other equipment may be furnished either as separate items or as components of a complete system such as an engine analyzer. Equipment requirements include wrenches, socket sets, screwdrivers, thickness gauges, pliers, other tools necessary to perform tuneup-related repairs, and

(1) specifications for each EIS and other test equipment adopted by the implementing agency under 18 AAC 52.035(c)(3);

(2) a high impedance digital ohmmeter;

(3) a hand-held voltmeter;

(4) an engine tachometer;

(5) a hand-operated vacuum pump with pressure gauge;

(6) an ignition timing light;

(7) an engine compression test gauge;

(8) scan tools, supplemental analyzer provisions, or detailed reference materials sufficient to allow the extraction and interpretation of diagnostic trouble codes from any vehicle equipped with an exhaust oxygen sensor and malfunction indicator light;

(9) repealed 1/1/97;

(10) a current quick-reference emissions control systems applications guide, located on or near the EIS;

(11) a dual probe attachment for the EIS;

(12) a choke checker or equivalent instrument that produces sufficient heat and cold to satisfactorily check the operation of bulb-type intake air heaters;

(13) a propane enrichment carburetor adjustment kit;

(14) calibration gases approved under Part I, Section 6 of the program manual;

(15) a separate, dedicated telephone line connected to each EIS;

(16) a separate, dedicated supply of shop air for use at the EIS; and

(17) any other special tools or equipment mandated or recommended for use by each vehicle manufacturer for each vehicle the station repairs; and

(18) in each facility, one dial-up Internet account that is

(A) established with the telecommunications utility under contract with the state to provide telecommunications services to the state; and

(B) dedicated for remote access communications between the department and the

(i) EIS

(ii) division of motor vehicles in the Department of Administration; and

(iii) implementing agency. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161; am 02/18/2006, Register 177)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.525. REMOTE STATION OPERATION. The implementing agency may not certify a mobile I/M test station under this chapter, but may permit I/M tests to be performed at locations not normally used as I/M stations. The implementing agency may issue a remote I/M station certification to an I/M station seeking remote operation capability. A remote station shall be certified if

(1) the station provides only I/M tests, with no repairs performed at the remote site;

(2) the operator currently operates a certified station at a permanent location;

(3) written notice is provided to the implementing agency at least two working days before any I/M tests are performed at the remote location; notice under this paragraph must include the date, beginning and ending times of operation, location of the remote operation, the mechanic's name and certification number, and the serial number of the EIS;

(4) the facility where remote operations are to be performed meets the applicable requirements of 18 AAC 52.500 and is open for inspection by the implementing agency when I/M tests are being performed;

(5) certificates are displayed as required in 18 AAC 52.510 and kept separate from those issued to any other station;

(6) all records and files are maintained at the permanent station designated in the application;

(7) field inspectors are granted access to perform overt and covert performance reviews at the remote station, including a review of work orders, VIR records, repair estimates, other I/M documentation, and an inventory of all certificates of inspection issued at the station; if an employee is not available to provide access, the station shall provide the records as soon as the activity that the employee is engaged in is completed, or within one hour, whichever occurs first;

(8) the manufacturer of the EIS has reviewed the proposed operations and has certified to the implementing agency that the system will perform within design specifications for that system under the type of operation proposed at the remote station, including provisions for overnight storage, minimizing temperature fluctuations between storage and operating environments, transportation procedures, and electrical supply;

(9) the manufacturer continues to warrant the EIS; and

(10) the I/M station meets applicable requirements of this chapter whenever I/M tests are performed by a certified mechanic at the remote station, including the requirements regarding a dedicated phone line for the EIS, certified mechanics, tools, equipment and reference materials. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144; am 1/1/2000, Register 152)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.527. PRESCREENING PROHIBITED. Prescreening is prohibited. (Eff. 6/24/94, Register 130; am 1/1/98, Register 144; am 1/1/2000, Register 152)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.530. PRELIMINARY INSPECTION. (a) Unless provided otherwise in this section, and after a motorist accepts a certified station's cost quotation, the station shall inspect all vehicles subject to inspection under this chapter.

(b) A certified station shall first determine whether a vehicle is subject to this chapter. The owner or operator of the certified station, or a certified mechanic employed by the station shall inform the motorist that an inspection is not required for a vehicle

(1) that is exempt under 18 AAC 52.005(f);

(2) with a registration renewal date more than 90 days in the future;

(3) Repealed 1/1/98; and

(4) with a registration renewal due the next year, unless the renewal date is 90 days or less in the future.

(c) Unless the implementing agency provides otherwise, the owner or operator of the station, or a certified mechanic employed by the station, shall refer the following vehicles to the referee facility or the implementing agency for an I/M test or to verify qualification for a waiver under 18 AAC 52.060:

(1) a diesel-fueled vehicle;

(2) a grey market vehicle;

(3) a vehicle designed or modified to run on an alternate fuel; the referee facility or a certified station that has been approved by the department to test dual-fuel vehicles will inspect a dual-fuel vehicle in this category to ensure that all required equipment is present and operable; the referee facility or a certified station that has been approved by the department to test dual-fuel vehicles will perform one I/M test on the vehicle in the gasoline mode and one I/M test while the vehicle is in the alternate-fuel mode to ensure that tailpipe emission levels that are measured by both tests meet the standards in 18 AAC 52.050; a vehicle using an oxygenated fuel blend approved for use under 18 AAC 53 may be tested at any certified station;

(4) a vehicle equipped with an engine other than the engine originally installed in the vehicle, except that

(A) a vehicle with a label affixed to it by the referee facility may be I/M-tested to the specifications stipulated on the label;

(B) an engine of the same size remanufactured for the correct application is not considered a different engine for purposes of this paragraph, and a vehicle containing such an engine may be I/M-tested; and

(C) repealed 1/4/95;

(5) a vehicle with its odometer reading obscured or unreadable for any reason, unless the motorist authorizes its repair;

(6) a used vehicle that was purchased from a person engaged in the business of selling used vehicles and that requires a transfer of ownership under AS 45.45.400(a); for a vehicle described in this paragraph, the certified mechanic or station shall refer the motorist to the dealer who sold the vehicle; and

(7) a vehicle that causes the EIS to abort the I/M test due to incompatibility between the vehicle and the EIS.

(d) After determining that a vehicle is subject to an I/M test, a certified mechanic or station shall conduct, at no charge to the motorist, a preliminary safety inspection before testing. With the implementing agency's approval, the preliminary inspection may be included as part of the I/M test. The mechanic or station shall reject for testing, or abort the test on, any vehicle found to be unsafe. The following are examples of situations that could preclude proper completion of an inspection or test:

(1) major oil system leak;

(2) major transmission leak;

(3) major coolant system leak;

(4) fuel system leak;

(5) excessive exhaust system leak;

(6) unable to hold steady engine RPM;

(7) unusual engine noises;

(8) engine warning light on;

(9) Repealed 1/1/98; and

(10) any other safety problem on the vehicle that makes the vehicle unsafe for testing.

(e) After a certified mechanic determines that a vehicle needs an I/M test and that any defect listed in (d) of this section has been repaired as required by 18 AAC 52.060, the certified mechanic shall perform a complete I/M test

(1) as required by this chapter; or

(2) if requested by the motorist. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/4/95, Register 133; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.535. TEST ABORT CONDITIONS. (a) If a vehicle becomes untestable during an I/M test, the certified mechanic may abort the I/M test. The EIS must allow the operator to abort during the data entry or the I/M test. The EIS must request the reason for aborting the I/M test and print a vehicle inspection report (VIR) that the mechanic shall give to the motorist.

(b) The station may not charge the motorist for an aborted test unless the customer requests the test for purposes other than obtaining a certificate of inspection.

(c) If the condition that caused an I/M test to abort is due to the incompatibility of a vehicle and the EIS, the mechanic shall refer the motorist to the referee facility. (Eff. 2/1/94, Register 129; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

Editor's note: 18 AAC 52.535 took effect 2/1/94 as an emergency regulation. Due to technical corrections made by the regulations attorney in reviewing the "permanent" regulation for filing, the permanent regulation as it was published in Register 130, July 1994, differed from the emergency regulation even though the section's history note did not reflect an amendment to that section.

18 AAC 52.540. OFFICIAL I/M TESTING. (a) A certified mechanic shall perform official I/M testing as required in Part IV of the program manual. Before providing the motorist with an itemized estimate of repairs, the certified mechanic shall confirm that all parts are available for each repair, subject to the repair cost minimum. A certified mechanic may not begin a repair until all parts for that repair are available at the station. If parts are unavailable for one or more repairs, the certified mechanic shall provide the documentation listed in 18 AAC 52.070(e)(17).

(b) The certified station shall issue to the motorist a VIR for each vehicle inspected at that station that indicates whether the vehicle passed or failed its I/M test.

(c) The certified mechanic who conducts the I/M test shall

(1) calibrate and maintain each EIS and test equipment in accordance with the calibration and quality control procedures adopted by reference in 18 AAC 52.035(c)(1);

(2) measure the concentration of hydrocarbons, carbon monoxide, carbon dioxide, and oxygen at the tailpipe of a warmed-up vehicle at curb idle and at 2,500 rpm in accordance with test procedures adopted by reference in 18 AAC 52.035(c)(2) or, for non-exempt 1996 and newer model year vehicles, perform the OBDII portion of the I/M test;

(3) use an EIS that has been certified by the department under 18 AAC 52.420 and install and maintain a separate, dedicated telephone line for each EIS as required in the program manual;

(4) compare measured emissions of carbon monoxide and hydrocarbons to the emissions standards in 18 AAC 52.050 or the alternative standards established under 18 AAC 52.055 or, for 1996 and newer model year vehicles not exempted under 18 AAC 52.050(a)(1), perform the OBDII portion of the I/M test;

(5) perform visual inspection and functional tests on 1975 through 1995 model year vehicles and, as required by the implementing agency, on model year 1996 and newer vehicles for the presence and proper operation of the following emissions-related parts:

(A) positive crankcase ventilation (PCV) valve;

(B) air injection system;

(C) vacuum hoses and wiring;

(D) catalytic converter;

(E) emissions control system warning lights;

(F) oxygen sensor;

(G) major vacuum leaks;

(H) manifolds and ignition;

(I) intake air heater;

(J) carburetor or fuel injection system;

(K) early fuel evaporation (EFE) system;

(L) exhaust gas recirculation (EGR) system; and

(M) fuel evaporative control system;

(6) test exhaust emissions at curb idle and 2500 rpm of all vehicles subject to the I/M program, as determined by the implementing agency under 18 AAC 52.035(b); and

(7) test the on-board diagnostic system on those vehicles subject to OBDII testing as provided in Part I of the program manual. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 3/27/2002, Register 161)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.545. PARTS ON ORDER. (a) If, as part of an I/M test performed under 18 AAC 52.540(a), a certified mechanic determines that necessary repairs cannot be made before a vehicle's registration expires, the mechanic or station personnel shall complete an I/M estimate and determine parts availability. If the required parts are available locally, and the certified mechanic can complete the repairs in less than two weeks, the motorist shall have the vehicle repaired and tested before it is certified regardless of the date when the vehicle's registration expires.

(b) If the certified station cannot complete the necessary repairs because required parts must be ordered, the certified station shall provide the motorist with the documentation that the implementing agency requires the motorist to submit to the implementing agency or the referee facility along with the vehicle and the vehicle registration. The implementing agency may require the station to provide the documentation listed in 18 AAC 52.070(e)(16).

(c) If the certified station where the failing I/M test was performed cannot complete the necessary repairs because the required parts must be ordered, the implementing agency or referee facility may issue the motorist a temporary permit allowing the vehicle to be driven while parts are procured. The cost of parts and labor to repair the vehicle must be paid before a temporary permit may be issued under this subsection. A temporary permit may not be issued to a vehicle that is registered with a seasonal-use waiver between November 1 and March 31. A temporary permit issued under this subsection is valid for 30 days.

(d) The certified station shall advise the motorist to keep the information listed in (c) of this section with the vehicle registration and to take the information along with the vehicle to the referee facility for a temporary permit. The referee facility or the implementing agency will monitor the temporary permit until the required parts are available and the required repairs are complete.

(e) A certified station may not perform a partial repair of an emission control system and may begin a repair only when all required parts for that repair are available at the station. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/98, Register 144)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.546. UNAVAILABLE PARTS. (a) If, as part of an I/M test performed under 18 AAC 52.540(a), a certified mechanic determines under 18 AAC 52.540(a) that parts are unavailable for one or more repairs, has completed any repair for which all parts are available, and cannot make further repairs to meet the repair cost minimum, the mechanic shall

(1) refer the motorist to the referee station for an unavailable parts waiver under 18 AAC 52.060(a)(8); and

(2) provide the motorist with the documentation listed in 18 AAC 52.070(e)(17).

(b) A referee facility may approve a waiver under this section and issue a certificate of inspection for a vehicle that cannot be repaired because of unavailability of parts after ensuring that the proof submitted under 18 AAC 52.070(e)(17) is adequate and after inspecting the vehicle to verify the need for each repair. (Eff. 1/1/98, Register 144)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

18 AAC 52.550. RECORDKEEPING REQUIREMENTS. The owner or operator of a certified station shall

(1) maintain at the station legible copies of all work orders, repair estimates, vehicle inspection reports, invoices used to document repairs and inspections, and any other document related to the I/M program;

(2) ensure that records are kept for at least two years after the date of the repair or inspection unless collected by the implementing agency;

(3) make the records available for inspection by the implementing agency or another law enforcement official; and

(4) keep and maintain the records so that they are immediately accessible by using information recorded on the VIR prepared for each vehicle. (Eff. 2/1/94, Register 129; am 6/24/94, Register 130)

Authority: AS 46.03.020 AS 46.14.030 AS 46.14.510

ARTICLE 9. GENERAL PROVISIONS.

Section
990. Definitions

18 AAC 52.990. DEFINITIONS. In this chapter, unless the context requires otherwise

(1) "aftermarket part" means a part that is not manufactured by the original equipment manufacturer;

(2) "after-repair test" or "'A' test" means an I/M test performed after an I/M repair;

(3) "alternate fuel" means a fuel other than gasoline or diesel fuel used to power a motor vehicle; "alternate fuel" does not include an oxygenated fuel approved for use under 18 AAC 53;

(4) “BAR” means California Bureau of Automotive Repair;

(5) "CARB" means the California Air Resources Board;

(6) "centralized inspection program" means an I/M program under which an I/M test is conducted at a centralized test-only inspection facility operated by the implementing agency or its contractor; only inspections, not repairs, of motor vehicles are permitted at a test-only inspection facility;

(7) "certificate of inspection" and “certificate” mean the windshield sticker described in 18 AAC 52.020(d)

(8) "certified mechanic" means a mechanic certified under this chapter for the performance of I/M tests and other inspections and repairs subject to this chapter;

(9) "certified mechanic or station" means a certified mechanic or a certified station, as applicable;

(10) "certified station" means a facility certified under this chapter for the performance of I/M tests and other inspections and repairs subject to this chapter;

(11) “commute” means to travel between a motorist’s residence and an I/M area, a nonattainment area, or a maintenance area for purposes of work or school;

(12) “compliance rate” means the number of vehicles that obtain certificates under an I/M program during one year, divided by the estimated number of vehicles that should have been inspected during that year;

(13) "covert performance review" means an investigation conducted by the department, the department's contractor, an implementing agency, or an implementing agency's contractor to evaluate the performance of a certified mechanic or station without the knowledge of the mechanic or station;

(14) "curb idle" means the manufacturer's suggested engine operating speed in revolutions per minute when the vehicle transmission is placed in either the neutral or park position and the engine has reached its normal operating temperature;

(15) "custom-manufactured vehicle" means a vehicle that has not been certified by the EPA as meeting federal motor vehicle emissions standards or by the CARB as meeting California motor vehicle emissions standards;

(16) "decentralized inspection program" means an I/M program under which a certified mechanic conducts emissions testing at a privately owned and operated certified station;

(17) "department" means the Alaska Department of Environmental Conservation;

(18) "documented vehicle" means a vehicle for which a referee facility has verified the state of the emissions control system repair and which is taken by the department, the department's contractor, an implementing agency, or an implementing agency's contractor to a certified mechanic or station for an overt or covert performance review of the mechanic or station;

(19) repealed 3/27/2002;

(20) "dual-fuel vehicle" means a vehicle that is capable of operating on gasoline as well as on propane or some other fuel;

(21) "economic hardship" means a finding under this chapter that a person does not have sufficient assets, credit, or other means to pay for an emissions-related repair required by this chapter;

(22) “EIS” or “emissions inspection system” means the system, including exhaust gas sampling, and analysis equipment and computer control for that equipment, used at a certified station to measure and record vehicle exhaust emissions;

(23) "emissions control system" means any element of either a motor vehicle's air pollution control system or another mechanism of a motor vehicle that affects the vehicle's release of air pollutants into the atmosphere;

(24) "emissions-related adjustments" means idle mixture setting, curb idle speed setting, fast idle speed setting, ignition dwell angle (if applicable), spark advance setting, choke setting, and any other motor vehicle adjustment that affects a motor vehicle's release of air pollutants into the atmosphere;

(25) "emissions-related part" means a motor vehicle part that affects the vehicle's release of air pollutants into the atmosphere, including

(A) fuel metering system components, such as the carburetor or fuel injection system and internal parts, air/fuel ratio feedback and control system including exhaust oxygen sensor, and cold start air/fuel ratio enrichment system;

(B) air induction system components, such as the controlled hot air intake system, intake manifold, heat riser valve and assembly, and turbocharger systems;

(C) ignition system components, such as the distributor and internal parts, spark advance or retard system, spark plugs, ignition coil or control module, and ignition wires;

(D) evaporative control system components, such as the vapor storage canister, vapor-liquid separator, fuel tank and filler cap, positive crankcase ventilation (PCV) system, PCV valve, and oil filler cap;

(E) exhaust gas recirculation (EGR) system components, such as the EGR valve body and carburetor spacer, and EGR rate feedback and control system;

(F) air injection system components, such as the air pump or air aspirator, valves affecting distribution of air flow, and air distribution manifold;

(G) catalyst or thermal reactor system components, such as catalytic converters, thermal reactors, exhaust manifold, and exhaust port liners or double walled exhaust pipe;

(H) basic engine parts, such as the camshaft, pistons, and cylinder heads; and

(I) miscellaneous items used in the systems listed in (A) - (H) of this paragraph, such as

(i) hoses, clamps, fittings, and tubing;

(ii) sealing gaskets or devices;

(iii) mounting hardware, pulleys, belts, idlers, and electronic controls; and

(iv) vacuum, temperature, and time-sensitive valves and switches;

(26) "emissions-related repair" means a motor vehicle repair that affects a vehicle's emissions and that is made to correct or prevent an automotive exhaust emissions problem;

(27) "EPA" means the United States Environmental Protection Agency;

(28) "failure rate" means the rate determined by comparing the annual number of vehicles that fail an initial I/M test performed under this chapter with the annual number of initial inspections;

(29) "fleet operator" means the owner of 10 or more vehicles that are subject to this chapter;

(30) "FTP" or "federal test procedure" means the emissions testing procedure used by the EPA to certify new motor vehicles as meeting applicable federal emissions standards;

(31) "grey market vehicle" means a vehicle manufactured for use outside of, and imported into, the United States;

(32) “GVWR” means gross vehicle weight rating;

(33) "I/M" means inspection and maintenance;

(34) "I/M area" means

(A) an area in the state listed in 18 AAC 52.005(g); and

(B) an emissions inspection and maintenance area when ownership of a vehicle is transferred under AS 28.10.271(d);

(35) "I/M office" means the office within the department that is responsible for the administration and enforcement of all aspects of the I/M program;

(36) "I/M program" means a motor vehicle emissions inspection and maintenance program approved or administered by the department under this chapter, the purposes of which are to determine whether a motor vehicle emissions control system has been properly maintained and to otherwise carry out the requirements of this chapter;

(37) "I/M repair" means maintenance of and repair to a motor vehicle performed to meet the requirements of this chapter;

(38) "I/M test" means a vehicle emissions inspection, performed at a certified station, which may include a visual and functional inspection of the emissions control system and the measurement of tailpipe emissions concentrations or evaluating a vehicle's OBDII system;

(39) "implementing agency" means either the department, a municipality or a borough that implements an I/M program;

(40) "initial inspection" or "'I' test" means the first I/M test performed on a vehicle at a certified station in each inspection cycle;

(41) "inspection cycle" means the two-year period between I/M tests;

(42) "kit car" or "vehicle assembled by a private party" means a vehicle assembled from a kit for the personal use of the motorist who assembles it and that has not been certified by the EPA as meeting federal motor vehicle emissions standards or by the CARB as meeting California motor vehicle emissions standards;

(43) "lessee" means a person who enters into either a lease or a lease-purchase agreement for a motor vehicle;

(44) "loaded mode" means a type of emissions test procedure in which a chassis dynamometer subjects a vehicle's engine to an increased load simulating the vehicle's performance under actual operating conditions;

(45) "local I/M administrator" means the person in charge of an implementing agency;

(46) "maintenance area" means an area that has been redesignated by the EPA from a designation of "nonattainment" to a designation of "attainment" and that is subject to a maintenance plan submitted as required by 42 U.S.C. 7505a(a) (commonly referred to as

sec. 175A(a), Clean Air Act), as amended through November 26, 1996;

(47) "model year" means the year identified in the vehicle identification number (VIN) located near the windshield on the driver's side of the instrument panel; for 1975 - 1980, the sixth digit of the vehicle identification number indicates the model year of the vehicle; for 1981-2009, the 10th digit of the vehicle identification number indicates the model year; the model year code from the vehicle identification number is as follows:

(A) 1979 – “9”;

(B) 1980 – “A”, with each subsequent year assigned the next letter of the alphabet and excluding the letters “I”, “O”, “Q”,”U” or ”Z”;

(C) 2001-“1”, with each subsequent year assigned the next cardinal number;

(48) "motorist" means

(A) the owner or lessee of a motor vehicle that is registered in this state or that is required to be registered in this state;

(B) a department, agency, or instrumentality of the federal government; or

(C) the owner or lessee of a vehicle registered in another state who is described in 18 AAC 52.005(d) and whose vehicle is not required to be registered in this state under AS 28.10.011;

(49) "motor vehicle" or “vehicle” has the meaning given “motor vehicle” in AS 28.40.100;

(50) "motor vehicle dealer" has the meaning given in AS 08.66.350;

(51) "nonattainment area" means an area that does not meet the national ambient air quality standard for carbon monoxide;

(52) "nonconforming vehicle" means a vehicle, including a kit car, that was not certified by the EPA as conforming to applicable federal motor vehicle emissions standards or by the CARB as meeting California motor vehicle emissions standards;

(53) "OBDII" means the on-board diagnostics system (phase II) required under

40 C.F.R. 51.352 to be inspected in 1996 and newer model year light-duty vehicles and light-duty trucks;

(54) "overt performance review" means an investigation conducted by the department, the department's contractor, an implementing agency, or an implementing agency's contractor to evaluate the performance of a certified mechanic or station during which the mechanic or the station owner is told about the investigation;

(55) "pattern failure" means a failure of an I/M test by a class of vehicles that is due to certain design characteristics that cause repeated failures of the I/M test and is recognized by the EPA;

(56) "prescreening" means to visually or otherwise inspect a vehicle before an I/M test without recording the results of the inspection or submitting those results to the implementing agency;

(57) "principally located or operated" means to use, locate, or operate a vehicle, including a leased vehicle, regardless of the place where the vehicle is registered, within an I/M area for more than 30 days during an inspection cycle;

(58) "program administrator" means the person in charge of the department's I/M office;

(59) "program manual" means the department publication entitled *Alaska I/M Program Manual*, adopted by reference in 18 AAC 52.005;

(60) "repair cost minimum" means the minimum required expenditure to complete necessary emissions-related repairs to a motor vehicle as required by 18 AAC 52.065 for each inspection cycle;

(61) "repair necessary to correct safety problems" means a repair

(A) that is required to correct a safety-related defect, such as a fuel system leak, and that, until completed, prevents a vehicle from being safely inspected; or

(B) that, under 18 AAC 52.530(d), requires rejection of a vehicle for testing;

(62) "residential address" means,

(A) for a noncommercial vehicle that is owned or leased by a motorist, the address, legal description, or physical description of the motorist's principal place of residence; for purposes of this subparagraph,

(i) "principal place of residence" means the place where the motorist is registered to vote, usually resides, resides the majority of the time, or returns to after periods of temporary absence;

(ii) if the vehicle is jointly owned or leased by motorists or persons having different residential addresses or different principal places of residence, the residential address to be applied to the vehicle is that one residential address that best identifies where the vehicle is principally located or operated; or

(B) for a commercial vehicle that is owned or leased by a motorist in conjunction with a business, the address where the business to which the vehicle is registered is principally located or operated;

(63) "resides in an I/M area" means has a residential address in an I/M area;

(64) "steady-state" means a type of loaded mode emissions test cycle in which the vehicle engine is subjected to a constant dynamometer load;

(65) "stoichiometric" means, as applied to a motor vehicle, the air-to fuel ratio in a vehicle that is necessary to achieve complete fuel combustion; in a motor vehicle, if calculated by the weight of air and fuel, the air-to-fuel ratio should be approximately 14.7:1 (that is, 14.7 pounds of air to one pound of fuel for gasoline that contains neither alcohol nor oxygenate);

(66) "tampering" means

(A) using leaded gasoline in a vehicle originally equipped with a catalytic converter;

(B) failing to maintain a vehicle's emissions control system or emissions-related part according to the manufacturer's specifications, including the failure to maintain a part, the malfunction of which causes an emissions-related part to fail; or

(C) removing, bypassing, defeating, disconnecting, rendering inoperative or modifying any emissions control system or emissions-related part

(i) repealed 02/18/2006;

(ii) that causes the vehicle to differ from its EPA-certified configuration;

(67) "transient loaded mode" means a type of loaded mode emissions test cycle in which a vehicle engine is subjected to a varying dynamometer load;

(68) “unauthorized or illegal modification” means

(A) tampering;

(B) the use of an aftermarket emissions-related part that is not functionally identical to the original equipment part being replaced; or

(C) the use of any added part or system unless that part or system has been specifically approved for use by the EPA, the CARB, the program administrator, or the local I/M administrator;

(69) "vehicle type" means the class or category of vehicle, based on gross vehicle weight, or type of fuel used;

(70) "VIR" or "vehicle inspection report" means the computer-generated results of an I/M test that is given to each motorist whose vehicle is tested under this chapter;

(71) "waiver" means a conditional exemption to one or more of the requirements of this chapter;

(72) "waiver rate" means the rate determined by comparing the annual number of vehicles that received repair cost minimum waivers with the annual number of vehicles that failed an initial I/M test;

(73) “windshield sticker” or “sticker” means the certificate of inspection that is affixed to a vehicle’s windshield by the certified mechanic upon passage of the I/M test or the visual identification of a program waiver, new vehicle, or exemption from the requirements of this chapter;

(74) “light-duty” means a vehicle with a gross vehicle weight of 8,500 pounds or less;

(75) “MIL” means a malfunction indicator lamp located on the instrument panel of a vehicle that illuminates if a diagnostic trouble code (DTC) in the memory of an OBDII

system is set as a result of an emission related component or monitor failure;

(76) "certificate holder" means a clear plastic device

(A) for the purpose of displaying a seasonal waiver issued under 18 AAC 52.060 through the windshield of a show, classic, or collector vehicle; and

(B) that is issued and certified by the implementing agency and identified with a serial number;

(77) "show, classic, or collector vehicle" means a vehicle that

(A) has been issued a seasonal waiver under 18 AAC 52.060;

(B) is not driven more than 2,500 miles per calendar year;

(C) is 25 or more years old;

(D) because of limited production or exceptionally fine workmanship is a rarity of historic interest; and

(E) has been restored, maintained, or preserved.

(78) "new vehicle" means a vehicle

(A) that is a 2004 model year vehicle or newer; and

(B) with a model year number that is no lower than the number of the current calendar year minus four.

(Eff. 2/1/94, Register 129; am 6/24/94, Register 130; am 1/1/97, Register 140; am 1/1/98, Register 144; am 1/1/2000, Register 152; am 12/30/2000, Register 156; am 3/27/2002, Register 161; am 02/18/2006, Register 177)

Authority: AS 46.03.010 AS 46.14.030 AS 46.14.510
AS 46.03.020

Editor's note: Lists of approved parts and systems referred to in this section's definition of "unauthorized or illegal modification" may be found in the State Air Quality Plan, Volume III, adopted by reference in 18 AAC 50.030 and at Part V of the program manual adopted by reference in 18 AAC 52.005. Both the air quality plan and the program manual may be reviewed at or obtained from the implementing agency or the department's Anchorage, Fairbanks, or Juneau offices.

Alaska Department of Environmental Conservation

Amendments to:

State Air Quality Control Plan

Vol. III: Appendices

Appendix III.C.3

Adopted
April 4, 2008

Fairbanks 2005-2015 Carbon Monoxide Emission Inventory

Report No. SR2007-10-02

Fairbanks 2005 – 2015 Carbon Monoxide Emission Inventory

prepared for:

Fairbanks North Star Borough

October 25, 2007

prepared by:

Sierra Research, Inc.
1801 J Street
Sacramento, California 95811
(916) 444-6666

Report No. SR2007-10-02

Fairbanks 2005 - 2015
Carbon Monoxide Emission Inventory

prepared for:
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October 25, 2007

prepared by:

Sierra Research, Inc.
1801 J Street
Sacramento, California 95811
(916) 444-6666

Preface

This inventory of carbon monoxide emissions in the Fairbanks North Star Borough CO nonattainment area for 2005–2015 has been prepared by Sierra Research, Inc., based on traffic data provided by the Alaska Department of Transportation and Public Facilities, stationary source information provided by the Alaska Department of Environmental Conservation, and area source data collected by the Borough's Environmental Services Division. This inventory has been developed for submittal to the Alaska Department of Environmental Conservation and the U.S. Environmental Protection Agency as the official 2005–2015 CO Emission Inventory, and for use in evaluating the effects on future emissions of potential local, state, and federal regulatory control programs.

FAIRBANKS 2005 – 2015
CARBON MONOXIDE EMISSION INVENTORY

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1. INTRODUCTION

The Fairbanks North Star Borough (referred to as either FNSB or the Borough) is located in the central portion of the state of Alaska. With a population of 85,930 people in 2005, it is the second largest community in the state. Much of the Borough's population is concentrated in the urban area in and around the city of Fairbanks. The combination of extreme cold temperatures and thermal inversions, common during winter months, results in the trapping of carbon monoxide (CO) emitted from combustion sources in the urban area. Fairbanks was first identified as experiencing high levels of ambient CO concentrations in the early 1970s. Since that time, extensive monitoring programs have demonstrated elevated levels of CO throughout the community. These concentrations have continued to exceed the national ambient air quality standards (NAAQS) for CO for the past three decades.

The urban portion of the Borough was designated as a "moderate" nonattainment area for CO under the 1990 Clean Air Act (CAA) Amendments. On March 30, 1998, Fairbanks was reclassified as a "serious" CO nonattainment area for failing to attain the ambient standard by the December 31, 1995 deadline mandated for moderate CO nonattainment areas. On July 5, 2002, EPA announced in a Federal Register Notice that the Fairbanks serious CO nonattainment area attained the NAAQS for CO by its attainment date of December 31, 2001. On July 27, 2004, EPA announced in a Federal Register Notice the redesignation of the Fairbanks CO nonattainment area to attainment and approval of the CO Maintenance Plan for Fairbanks.

This report documents the development of source-specific CO emissions for the nonattainment area for use in a revision to the approved maintenance plan, which will be submitted to EPA. The emission inventory developed in this report reflects the benefits of all committed control measures except for those listed in Table III.C.2 of the new Maintenance Plan (e.g., wood burning ban, oxygen sensor replacement, etc.).

Estimates of the 2005–2015 emission inventory were prepared following the procedures employed in the emissions inventory used in the previous Maintenance Plan[1*] and supporting emissions inventory documentation.[2] Certain improvements in the methods and procedures employed in that effort were made to take advantage of new vehicle test and activity data collected since the completion of the previous emissions inventory. These changes are documented in this report. Quality assurance procedures[3] laid out by the Alaska Department of Environmental Conservation (ADEC) were followed to assure the accuracy of the compiled data.

Data provided by the FNSB Environmental Services Division, the Alaska Department of Transportation and Public Facilities (ADOT&PF), and ADEC were used to generate the

[*] Superscripts denote references provided in Section 7.

inventory. Data furnished by FNSB include non-highway mobile source and area source fuel use and activity estimates. ADOT&PF supplied motor vehicle roadway traffic levels, and ADEC supplied stationary source activity data and related emission estimates. ADOT and Fairbanks International Airport, and personnel from Fort Wainwright and Eielson Air Force Base supplied data on aircraft activity levels.

Figure 1-1 displays the location of each of the subregions, described below, that make up the Borough. The inventory has been prepared only for the Fairbanks North Star Borough nonattainment area.

1. The actual CO nonattainment area (also referred to as the urban area), which lies within a small portion of the Borough.

2. The Fairbanks urban transportation planning network area, also known as the Fairbanks Metropolitan Area Transportation Study (FMATS) area (which includes the nonattainment area)—emission estimates for this category cover that portion that does not include the nonattainment area.

3. The remaining portion of the Borough outside of the FMATs area, which is largely rural in nature.

Air pollutant emissions are historically divided into three general categories: mobile source, area source, and point source emissions. These categories can be subdivided further into the emission types shown in Table 1-1.

In recent years there has been a substantial increase in the attention devoted to modeling emissions for the non-highway mobile source category. This includes nonroad vehicles, historically referred to as off-highway vehicles, as well as aircraft, railroad, and vessel emissions. To simplify the presentation of the non-highway sources, the data and methodologies for these sources are organized into a separate section of the report.

EPA has prepared technical guidance for the calculation of emissions from each of the source categories[4] outlined above, in addition to the previously referenced guidance on the preparation of post-1987 CO emission inventories. Rather than recreate the discussions contained in the referenced documents, this report presents a discussion of the methodology used to calculate emissions for each source category.

In general, emissions are calculated by multiplying emission rates by a known or assumed activity level for each source category. This level of activity may be further disaggregated by source type if sufficient data are available regarding both the activity level and the emission factor for a given source type. The level of accuracy achievable in an emission inventory is directly related to the accuracy of both the estimates of activity levels and the related emission factors.

Figure 1-1

Fairbanks Planning Boundaries

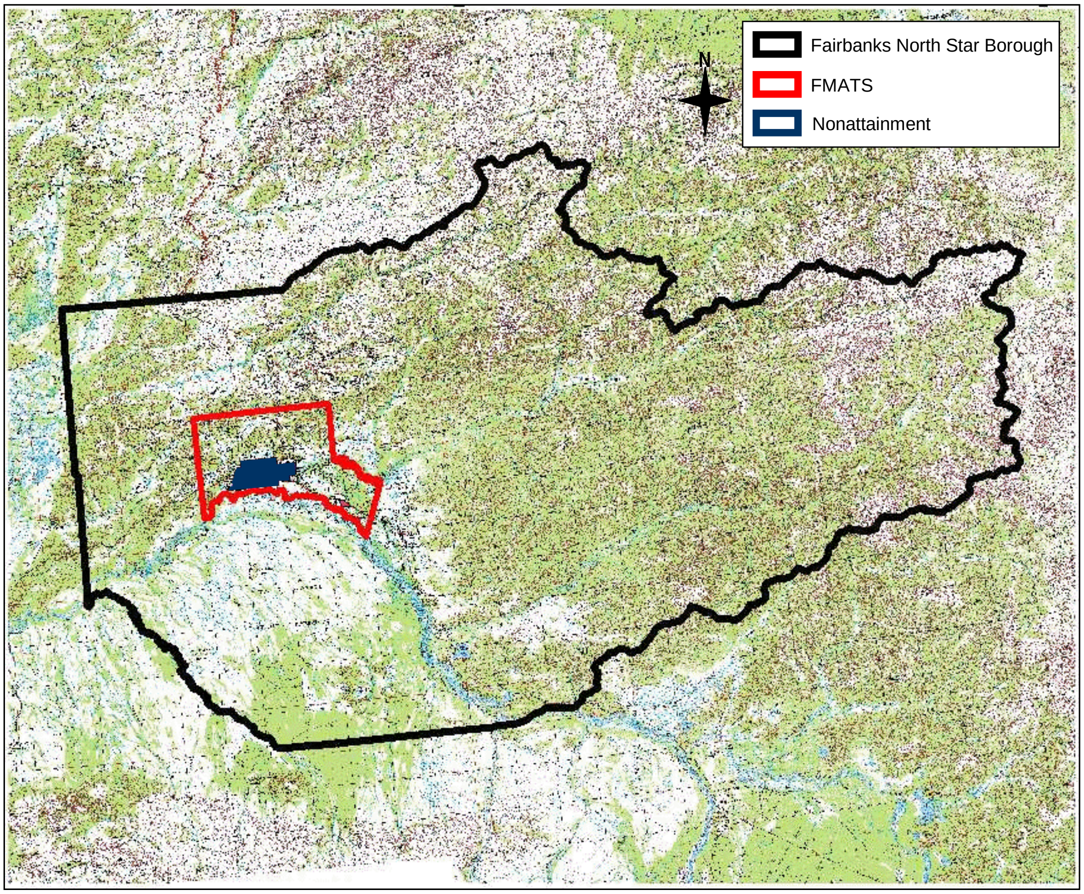

Table 1-1 Emission Source Types	
Category	Subcategory
Mobile Sources	Highway Vehicles Off-Highway Vehicles Aircraft Railroad Locomotives Vessels*
Area Sources	External Fuel Combustion Industrial Internal Combustion Equipment Open Burning Prescribed Fires* Solid Waste Incineration Structural Fires
Point Sources	Listed by Specific Source

* Not applicable for Fairbanks.

To model a worst-case CO episode, the inventory must be based on meteorological conditions and emissions most likely to cause exceedances of the NAAQS. Emissions calculated for this so-called "design day" are compared to the second highest annual ambient CO concentration recorded on the day selected to demonstrate maintenance. Therefore, all emissions must be calculated on the basis of the level of activity and rate of emission release assumed to occur under such worst-case (e.g., wintertime) conditions for Fairbanks.

Six sections follow this introduction. Section 2 provides a summary of the data and calculations employed in computing on-road mobile source emission estimates. Section 3 provides a similar review for the non-road mobile sources. Section 4 provides a summary of the area source calculations, and Section 5 provides a summary of the point source calculations. An overall summary of the source-specific emission estimates for the nonattainment area is presented in Section 6. Section 7 contains a list of the references cited in this document. MOBILE6 input files are provided in Appendix A.

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2. ON-ROAD MOBILE SOURCE EMISSIONS

Starting in January of 2004, on-road mobile source emission inventories are required to be computed using emission factors generated by EPA's latest vehicle factor model, MOBILE6. The final version of MOBILE6 (version 6.2) was updated by EPA to account for CO benefits of the Low Emission Vehicle (LEV) and Tier 2 rulemaking, which required vehicle technology improvements to meet more stringent emissions standards for volatile organic compounds (VOC) and oxides of nitrogen (NOx). Despite this, however, the model does not adequately treat two very common wintertime practices in Fairbanks that significantly affect vehicle CO emissions:

1. Extended initial idling of vehicles to warm them up prior to travel; and

2. Use of "plug-in" heaters to keep the engine warm while parked for long periods to aid in cold start drivability.

To address these limitations, on-road mobile source emissions were computed using a methodology that combined estimates of warm-up idling and plug-in benefits with the "traveling" emission factors from MOBILE6. The warm-up idling portion of the on-road inventory was estimated using a "shell" program, which works with MOBILE6, called AKMOBILE6. This section of the report documents the methods and assumptions used to generate the entire on-road portion of the Fairbanks nonattainment CO inventory for 2005 through 2015.

Background

Extended initial idling of vehicles is known to occur during winter in Alaska.[5] Unfortunately, the MOBILE6 model is not well suited in its ability to explicitly represent extended initial vehicle idling.* In addition, the model cannot account for emission benefits that occur when a vehicle is started after being plugged in to an engine pre-heater.

* The basic emission factors in these models are based on transient (i.e., stop-and-go) driving patterns and represent composite emission rates over the duration of these driving patterns. Although these transient patterns include idling, separate emission factors for only the idle periods do not exist. Although inputs to these models can be specified so they output "idle" emission rates, these so-called idle rates are based on transient emission factors corrected to a 5-mph speed that are multiplied by 5 mph to produce gram-per-hour rates. Thus, these derived rates are not based on actual emission testing conducted at idle, nor do they reflect warm-up effects when a vehicle is idled for an extended period from a cold start.

A testing study was conducted in Anchorage and Fairbanks during the winter of 1998-99 to collect actual measurements of initial idle emission rates.[6] The study was performed for a sample of 111 automobiles and light-duty trucks under cold wintertime ambient conditions and measured minute-by-minute idle emissions as vehicles warmed up from a cold start (without being plugged in to a pre-heater). For a subset of the same vehicles, "plug in" idle tests were also conducted under which vehicles were plugged in prior to the cold start. In addition to this study, an additional 25 vehicles were tested during a follow-on study in Fairbanks during the winter of 2000-01.[7] During this study, "shorter soak" idle measurements (less than the 12-hour soak period used in the 1998-99 "cold-start" idle tests) were collected, including soaks of 20, 40, 60, and 120 minutes, followed by varying periods of initial idling (2-15 minutes). These sets of measurements from the 2000-01 testing program were available for 34 individual vehicles. Thus, the warm-up idle emission rates contained in AKMOBILE6 were based upon a total sample of 136 gasoline-powered cars and light-duty trucks. Analysis of the data from these studies produced the following findings:

- Initial idle emission rates are significant under cold start conditions;

- Idle emission benefits from fleet turnover are overstated in MOBILE5b and the CO Emissions Model (predecessors to MOBILE6) based on a comparison of measured idle emissions by model year range to those predicted by the models; and

- Use of plug-in pre-heaters during long soaks over four hours provides substantial initial idle CO emission reductions (over 70%) compared to cold start idling without prior plug-in.

The winter 2000-01 testing program also included emissions measurements over the Alaska Driving Cycle (ADC), a transient stop-and-go driving cycle that represents wintertime driving patterns in Alaska. The ADC was developed as part of a study funded by Fairbanks, Anchorage, and the Alaska Department of Environmental Conservation (ADEC).[8] The results of that study showed that the combination of snow and ice on roadways in Fairbanks and Anchorage limits the amount of high speed and high acceleration rates compared to that observed in the lower 48 states. As a result, wintertime driving in Alaska is very similar to the drive cycle specified in the Federal Test Procedure (FTP). It also means that the high acceleration rates addressed in the Supplemental FTP (SFTP) do not occur in Alaska during the winter. As a result, the significant CO reductions anticipated from federal regulations that control emissions during off-cycle operation (e.g., hard accelerations) are not applicable during the winter in Alaska. This means that the CO reductions associated with the SFTP regulations employed in MOBILE6 should not be included in wintertime vehicle CO emission estimates in Alaska.

As a result of these findings, AKMOBILE6 was developed in order to accurately estimate vehicle CO emissions in Alaska by:

- Utilizing idle and plug-in test results from the available studies to characterize initial idling emissions that occur during winter in Alaska; and

- Employing emission factors from MOBILE to calculate subsequent on-road emissions that occur as a vehicle travels after initial idle.

The approach is not trivial in that the measured idle emission rates had to be blended together with trip-based MOBILE emission factors. The effects of the initial idling, already accounted for using the measured idle test rates, had to be "backed out" of the MOBILE emission factors, which are based on the "cold start" (Bag 1), "stabilized" (Bag 2), and "hot start" (Bag 3) bags of the Federal Test Procedure (FTP).

To accomplish this blending, the methodology employed is referred to as "thermal state" tracking. Stated simply, thermal state tracking consists of determining how warmed-up a vehicle is at each of the following points in a vehicle trip:

- Before start-up;
- After initial idling; and
- "Overall" for the on-road traveling portion.

In order to determine the degree of warm-up at each of these points, the following trip characteristics were needed:

- Soak Time and Temperature – the duration of time that the vehicle was parked prior to the trip and the ambient temperature during that period;

- Initial Idle Time – the time that the vehicle was idled after start-up but before traveling;

- Trip Time – the traveled trip time, excluding initial idling time; and

- Trip Speed – the average speed of the trip, excluding initial idling time.

By computing the thermal state at each trip point based on the above characteristics, separate trip-specific emission factors were developed for the initial idle and on-road driving portions of each trip in a manner that reflected the different thermal (i.e., warm-up) states for a variety of trip types. For example, consider two hypothetical 10-mile-long vehicle trips as follows:

(1) "Home to work" – a morning trip that occurred after a 12-hour, overnight soak[*] with one minute of initial idling before on-road travel; and

(2) "Midday errand" – a return trip taken from running a midday errand after a short, 10-minute soak, also with one minute of initial idling.

[*] A "soak" refers to the period during which a vehicle was parked with the engine off prior to a trip.

The "home to work" trip is fully cold when the vehicle is started and initial idle begins. After only one minute of initial idle, the vehicle is still "mostly cold" and not fully warmed-up when it begins the on-road portion of the trip. On the other hand, the "midday errand" trip is likely to be fully warmed-up after only one minute of idling because it was parked for only 10 minutes prior to the trip. Thus, different MOBILE emission factors have to be used for the on-road portion of each trip that reflected how warmed-up the vehicle was at the start of the on-road travel.

The following sub-sections describe the details of the thermal state tracking methodology utilized in AKMOBILE6 and explain how it was used in conjunction with the idle test data and the MOBILE6 model to represent vehicle trip idling and traveling emissions.

Thermal State Concept

EPA has historically defined "cold" starts as those that occur after at least one hour of soak for catalyst vehicles and at least four hours of soak for non-catalyst vehicles. Vehicle starts with preceding soak times less than these limits have been considered "hot" starts.

As an alternative to these discrete definitions of cold and hot starts, the basic concept behind the Thermal State approach involved determining the degree to which a vehicle is warmed-up during the course of each trip element: before start-up, after initial idle, and "overall" for the on-road portion. Because each trip type consisted of different soak, initial idle, and on-road driving periods, the methodology was devised to compute the "thermal state" (i.e., degree of warm-up) along each leg of each trip as a function of these input trip characteristics.

This was accomplished in part by utilizing empirically derived engine coolant temperature equations that were developed under a vehicle study conducted by Radian Corporation for EPA.[9] Under that study, second-by-second data were collected from a series of vehicles equipped with an on-board instrumentation package. A total of 21 vehicles in Baltimore, Maryland and Spokane, Washington were instrumented with this "six-parameter" package during a field study conducted in the winter of 1992. Each vehicle was instrumented for a period between one and two weeks, and second-by-second, time-of-day data were recorded. The vehicles were driven normally by their owners during that period. The second-by-second data included ambient temperature, engine coolant temperature, and vehicle speed measurements. Because these measurements were recorded on a date and time basis, the data could be post-processed to determine park periods (when the engine was shut off) and trip characteristics while the vehicles were being driven. Data for over 2,400 trips (and their preceding soak periods) were recorded.

An equation was developed under the study to predict coolant temperature over time during cool-down (while parked and shut off). This coolant temperature-based equation was used to model initial idling emissions in AKMOBILE6. However, analysis of the 2000-01 testing program data revealed that although idle emission rates may stabilize after several minutes of initial idling, after-idle transient emissions indicate the vehicle is not fully warmed up.

This finding led to the use of a different relationship (than that based on coolant temperature) for determining a vehicle's thermal state after initial idling and modeling after-idle traveling emissions during transient driving. Both the initial idling and after-idle traveling emission methodologies are described below.

Initial Idling Emissions – The primary determinants of coolant temperature while a vehicle is parked during cool-down were found to be as follows:

- Time (i.e., the duration of the soak);
- Ambient temperature; and
- Engine size (reflecting the fact that smaller engines lose heat quicker).

The cool-down equation representing coolant temperature T_C as a function of these variables is shown below in Equation (1):

Eqn. (1)

$$T_C = T_A + (T_{C0} - T_{A0}) \times \exp(\frac{A}{D} \times t_{soak})$$

where T_C = coolant temperature (EC),
T_A = ambient temperature (EC),
T_{C0} = initial coolant temperature at start of soak (EC),
T_{A0} = initial ambient temperature at start of soak (EC),
A = -1.039 liters/hour (a constant),
D = engine size (liters), and
t_{soak} = soak time (hours).

Coolant temperature behavior during cool-down is shown in Figures 2-1 and 2-2. Figure 2-1 plots coolant temperature as a function of soak time at different ambient temperatures. (To simplify the figure, each ambient temperature was assumed to remain constant throughout the soak period.) As shown in Figure 2-1, the equation correctly models the impact of ambient temperature, i.e., cool-down occurs more quickly at colder ambient temperatures. Figure 2-2 illustrates the effect of engine size during cool-down. It reflects the fact that smaller engines cool more rapidly.

In AKMOBILE6, a vehicle was assumed to be fully warmed up at the start of the soak (i.e., at the end of the preceding trip). Thus, a constant value of 88EC (190EF) was assumed for T_{C0}. This value corresponds to a typical thermostat "set point" (i.e., the maximum coolant temperature as controlled by the thermostat). A constant value of D of 2.7 liters was also assumed based on the average engine size of vehicle in the combined 1998-1999 and 2000-2001 light-duty vehicle test fleets. Finally, the ambient temperature at the start of the soak T_{A0} was assumed to equal the ambient temperature at the end of the soak T_A. Thus, the above equation was simplified to compute coolant temperature T_C as a function of ambient temperature T_A and soak time t_{soak}.

Figure 2-1

Predicted Engine Cool-Down Temperature by Soak Time and Ambient Temperature (2.4L Engine, Starting Coolant Temp = 190F)

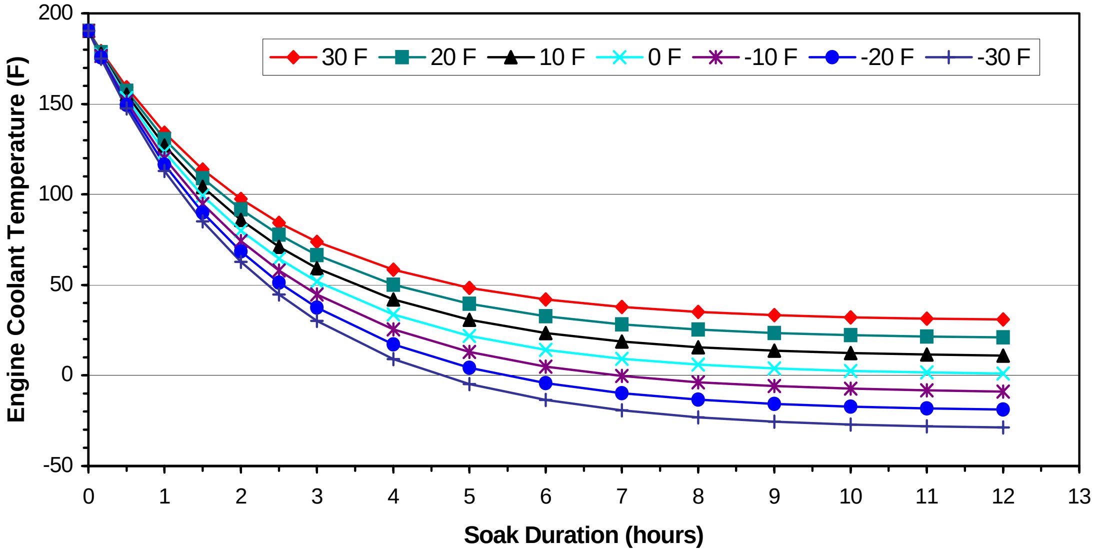
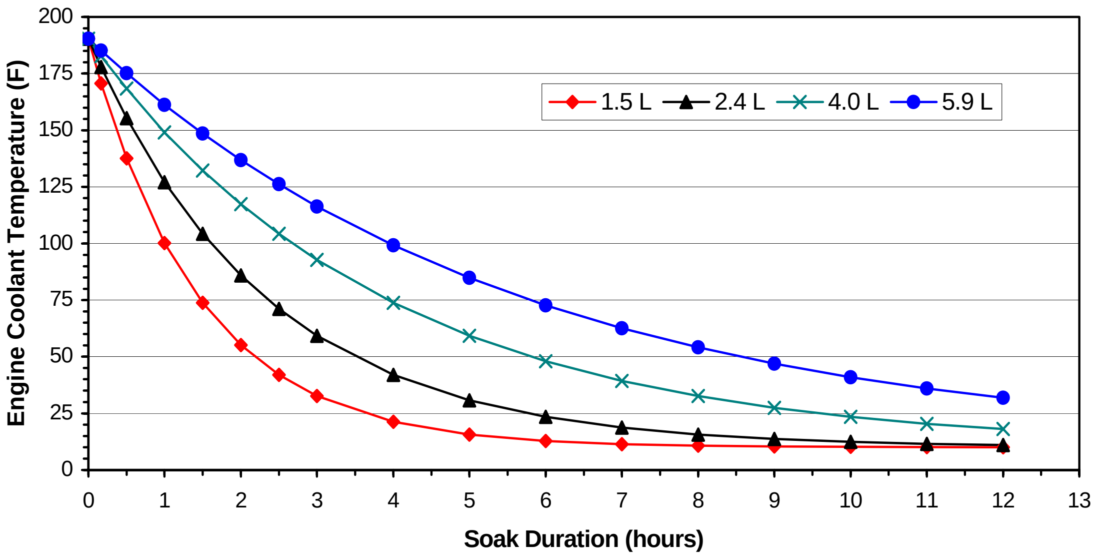


Figure 2-2

Predicted Engine Cool-Down Temperature by Soak Time and Engine Size at 10 Deg F (Starting Coolant Temp = 190F)



The coolant temperature after cool-down was used to calculate the initial thermal state (TS_I) prior to initial idling. Soak times of 12 hours or more reflect a TS_I of 1 (fully cold). Soak times of 10 minutes or less represent a fully warmed-up thermal state ($TS_I = 0$). Between these extremes, TS_I was calculated from coolant temperature T_C and ambient temperature T_A as follows:

Eqn. (2)

$$TS_I = \frac{88 - T_C}{88 - T_A}$$

The initial thermal state TS_I was then used to locate the "start point" on the cumulative warm-up idle emission curves by vehicle type and model year. Since a TSI of zero reflects fully warmed-up or stabilized idle emissions, values greater than zero were scaled off the idle stabilization time to determine the start point for computing idle emissions. For example, assuming an idle stabilization time t_0 of 10 minutes for a specific curve, a TS_I of 0.8 (representing a "mostly cold" soak) indicated that the start point on the cumulative idle curve was 8 minutes (10×0.8). For a given idling duration, the initial idling emissions are calculated as the difference between the starting and ending points on the cumulative emission curve. Continuing with the earlier example, for an idle duration of 5 minutes, emissions would be computed from the difference between the values at 8 and 13 minutes on the curve.

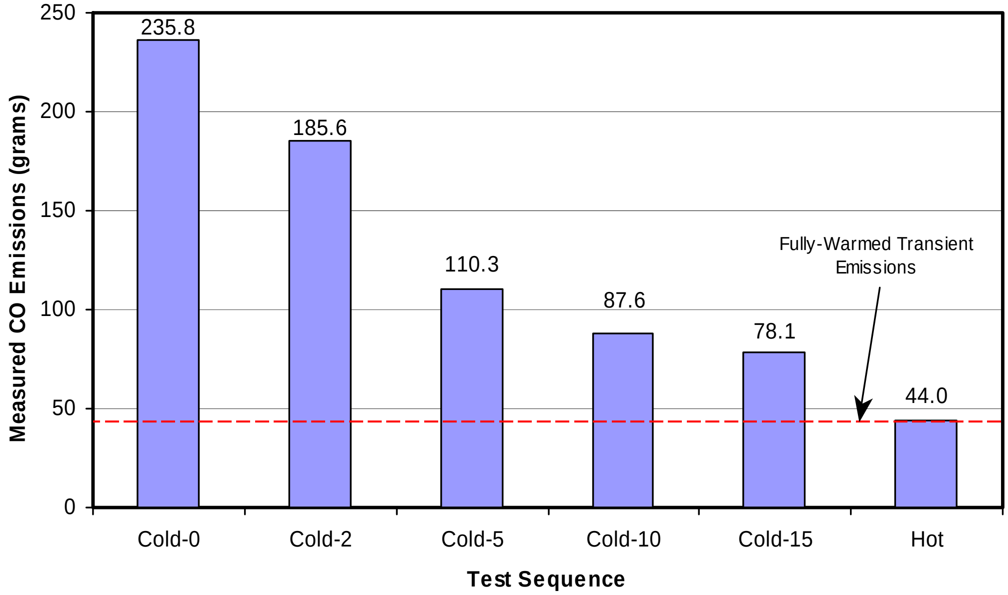
<u>After-Idle Transient Emissions</u> – The 2000-01 test measurements clearly showed that stabilization of initial idle emissions was not always indicative of a vehicle being fully warmed-up when subsequently tested over the ADC transient driving cycle. This was seen by comparing emissions measured over the ADC (not including preceding initial idle) for vehicles tested after overnight soaks and either zero, 2, 5, 10 or 15 minutes of initial idling followed immediately by an ADC against test sequences where back-to-back ADCs were run (and assumed to represent fully warmed transient emissions).

Figure 2-3 presents these results, which were based on measurements over each test sequence from 33 vehicles. The test sequences referred to as Cold-*x* are those that were soaked overnight and then tested with varying idle periods, followed immediately by an ADC, where *x* is the idling time in minutes. The "Hot" test sequence refers to the emissions measured over the second of back-to-back ADCs.

Figure 2-3 clearly shows that even after 15 minutes of initial idling (by which time all vehicles exhibit stabilized idle emission rates), subsequently measured transient emissions do not reflect complete warm-up, as indicated by the fact that the "Cold-15" emissions are nearly double that of the "Hot" emissions.

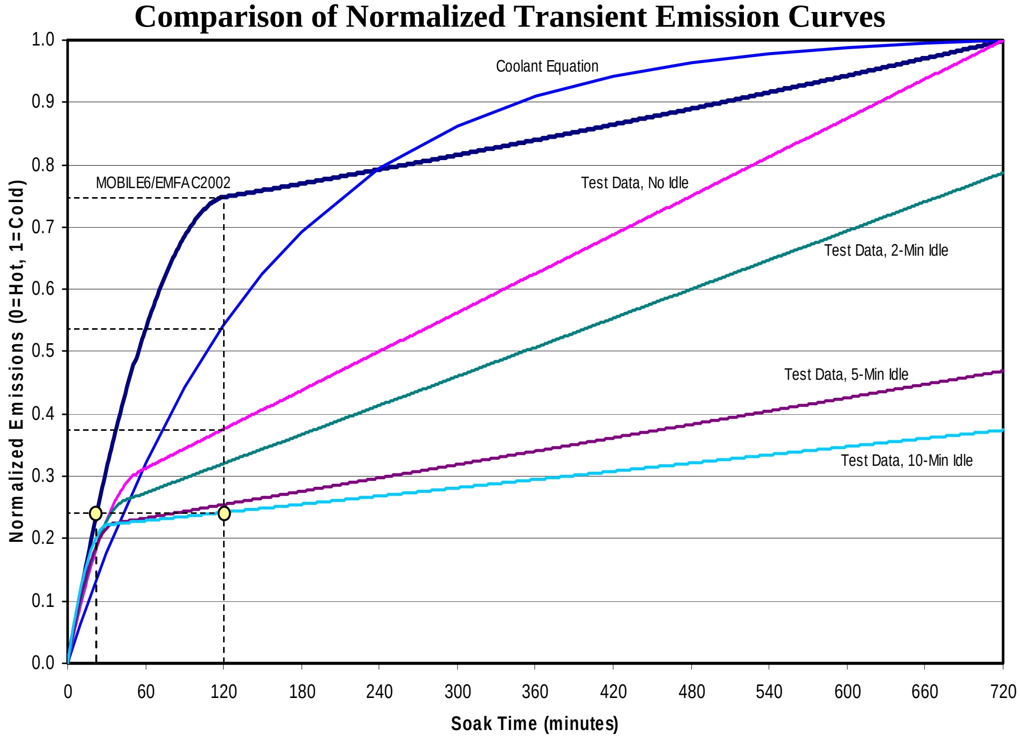
Using the emissions measurements over these test sequences as well as those for test sequences of ADCs with no preceding idle following 20-, 40-, 60-, and 120-minute soaks, a family of curves was developed to represent "normalized" (i.e., relative) transient emissions as a function of preceding soak and initial idle time. These measured transient emissions were normalized relative to fully warm (1-minute soak) and cold (720-minute soak) transient emission tests. Thus, they reflect an "after-idle" thermal state and vary between 0 (fully warm) and 1 (fully cold).

Figure 2-3
Comparison of Measured ADC CO Emissions by Test Sequence



The curves were developed using quadratic/linear segmented model forms and optimally fitted to the test data using the NLIN library procedure in SAS. Figure 2-4 displays this family of normalized emission curves and compares it to normalized emissions based on the aforementioned coolant temperature equation and the soak curve used in MOBILE6 to calculate incremental starting emissions.

Figure 2-4
Comparison of Normalized Transient Emission Curves



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As Figure 2-4 shows, comparison of the test measurement-based curves shows that initial idling has some effect on subsequent transient emissions. However, for significant soak periods of 12 hours (720 minutes) or more, even after initial idling events up to 15 minutes, normalized emissions are still roughly 40% of the difference between hot and cold transient levels.

Figure 2-4 also shows that these relationships differ significantly from those modeled using either the coolant equation or the soak curve in MOBILE6, as highlighted by a comparison of normalized emissions after a 120-minute soak indicated with dashed lines. The Alaska test data based curves indicate that normalized transient emissions are lower than modeled by MOBILE6.

This may seem counterintuitive since the engine and catalyst cool quicker in colder Alaskan temperatures than at the standard conditions reflected in the MOBILE6 curve. However, an explanation can be found from the coolant temperature equation, which predicts coolant temperature as a function of cool-down (i.e., soak) time in conjunction with the ambient temperature. This explanation is presented by example below.

The MOBILE6 soak curve is based on emissions measurements at ambient temperatures that average roughly 75°F. On the other hand, the average ambient temperature for the Alaska test measurements was approximately 10°F. Using the coolant equation, a 120-minute soak will result in cool-down (from a warmed-up temperature of 190°F) to 128°F at an ambient temperature of 75°F, which is 53°F over ambient. This translates to a thermal state of 0.55 ([190-128]/[190-75]). However, at an ambient temperature of only 10°F, a 120-minute cool-down will result in a coolant temperature of 94°F, which is still 84°F over ambient, and a thermal state of 0.53. Thus, at colder ambient temperatures the engine (and presumably the catalyst) is still much warmer than the surrounding temperature than is the case under warmer ambient conditions. This explains how transient emissions after a specific soak period may be lower on a relative basis in colder climates such as Alaska. However, absolute emissions (i.e., in grams) are still higher at colder temperatures.

Therefore, the normalized data based plots shown in Figure 2-4 were used to find the final thermal state for the vehicle after initial idling. This was then translated to the equivalent soak time in MOBILE6 that will result in the same normalized emissions as found in the collected data. To illustrate this process, note the dots on a couple of curves in Figure 2-4. The test data show that when a vehicle was idled for 10 minutes after a 2-hour soak (120 minutes), the normalized emissions are approximately 0.24. Tracing this normalized emissions value horizontally to the MOBILE6 curve, one can see that the equivalent soak time in MOBILE6 is about 25 minutes.

Step-by-Step Thermal State Methodology

The foundational elements of the approach used to quantify the initial idle component of total motor vehicle emissions were discussed above; the step-by-step details of the entire process used to estimate the Fairbanks on-road inventory are described below. These steps were applied to each separate trip type to properly account for the differing soak, initial idle, and on-road travel times of each trip type.

Step 1, Calculate Start-Up Coolant Temperature – The "cool-down" equation presented earlier as Equation (1) was used to determine the coolant temperature of the vehicle just before start-up. From that equation, coolant temperature was calculated as a function of the soak time preceding the trip, the ambient temperature, and the engine size.

A constant* ambient temperature of 0°F was assumed for "outside" trips (i.e., those trips that did not start from a sheltered or partially heated garage). Garaged trips were assumed to occur at a constant temperature of 50°F. (These temperature assumptions are further discussed in the "AKMOBILE6 and MOBILE6 Inputs and Assumptions" section.) As previously mentioned, a constant value of 2.7 liters was assumed for engine size based on the average engine size of vehicles in the combined 1998-99 and 2000-01 light-duty vehicle test fleets, and the initial coolant temperature (T_{C0} in Equation (1)) was set to the 88°C thermostat set point, which assumes that the prior trip was fully warmed up when it ended. Thus, with these assumed engine size and temperature inputs, the coolant cool-down equation was simplified to a singular function of the preceding soak time.

Step 2, Compute Start-Up Thermal State – Next, the thermal state of the engine at start-up was determined using Equation (2). A thermal state of 1.0 reflects a completely cold engine (where the coolant temperature has been cooled to the ambient temperature). A fully warmed engine has a thermal state of zero. Thus, the thermal state varies between 0 and 1 depending on the extent the engine has cooled.

Step 3, Determine Idle Emissions – Using profiles of minute-by-minute warm-up idle emissions developed from the 1998-99 and 2000-01 testing studies, warm-up idle emission rates in AKMOBILE6 were developed separately by vehicle type and model year range. The sample of idle test data was fitted to a series of curves as a continuous function of initial idling time, enabling the model to calculate initial idling emissions for any duration. The curve fitting was performed on measurements of cumulative idle CO (in grams) at the end of each minute, tabulated by vehicle type and model year range. A series of segmented curve fits were developed using a combination of polynomial and linear equations as shown below in Equation (3):

Eqn. (3)

$$E(t) = a + bt + ct^2 \quad \text{for } t < t_0 \quad \text{(quadratic model)}$$
$$= d + et \quad \text{for } f \geq t_0 \quad \text{(linear model)}$$

where $E(t)$ represents cumulative emissions at any time t (in minutes), t_0 is the transition point between the quadratic and linear segments of the curve and a, b, c, d and e are coefficients.

* To keep the calculation methodology from being unnecessarily complex, a constant ambient temperature was assumed to occur during the soak period prior to each trip. Thus from Equation (1), T_A was set equal to T_{A0}.

This segmented curve-fitting model was used since per-minute cold start idle emissions stabilize after a period of between five and fifteen minutes depending on the vehicle; thus, cumulative idle emissions follow a linear trend after this stabilization time defined as t_0. The *NLIN* library procedure in the SAS (Statistical Analysis Software) statistical software package was used to calculate optimized curve fits to the data. Figure 2-5 shows the resulting series of fitted curves by vehicle type and model year range. For comparison purposes, measured values are also plotted in Figure 2-5 at each minute using specific symbols for each model year range curve.

As Figure 2-5 shows, the curves for each vehicle type and model year range combination fit the measured data very closely; r^2 correlation coefficients exceeded 0.98 in all cases.

Step 4, Determine After-Idle Thermal State – Using the family of curves discussed previously and shown in Figure 2-4, the after-idle thermal state for each trip type is determined based on the initial soak time and idling duration. Again, the thermal state varies between 1 and 0 depending on the extent the engine has warmed up.

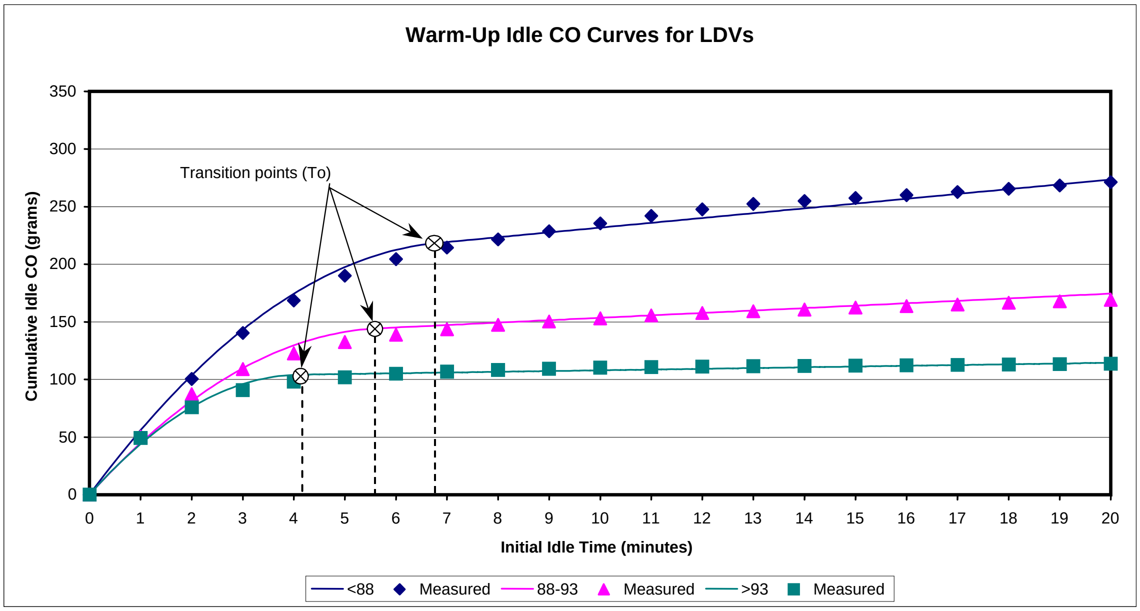
Step 5, Prepare Soak Distributions for MOBILE6 – The next step consisted of translating what is known about the thermal state of the vehicle after initial idling in order to determine the soak fractions used to model the on-road emission factors. As with Step 4 above, the family of curves shown in Figure 2-4 is used to generate the equivalent soak distributions for input into MOBILE6. Given the idle time curve and the soak time, the equivalent MOBILE6 soak time can be found by tracing the resulting normalized emissions or thermal state onto the MOBILE6 curve.

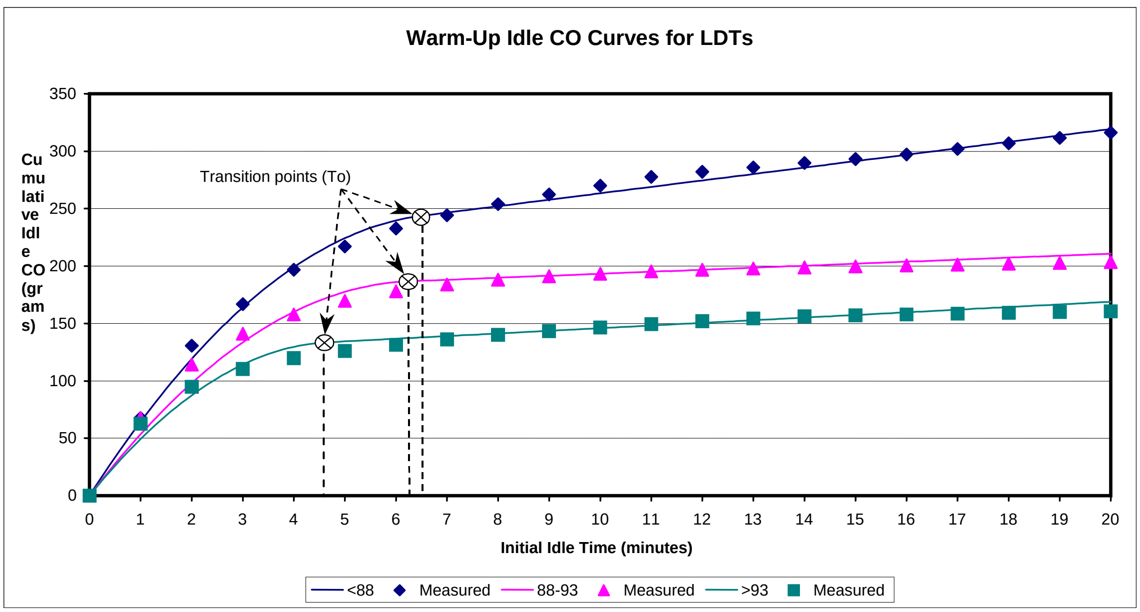
Step 6, Running MOBILE6 – The last step in developing the Fairbanks on-road inventory is running the MOBILE6 model to estimate the traveling-only CO emission factors. The soak distribution for each trip-type developed in Step 5 must be incorporated into a MOBILE6 run. For this, the "SOAK DISTRIBUTION" command in MOBILE6, which enables overriding the soak defaults in the model, must be used.[10] This process is accomplished by designing AKMOBILE6 such that it can be used in conjunction with MOBILE6. The following section describes the design of the AKMOBILE6 model and the assumptions used in the model for estimating the Fairbanks on-road inventory.

The AKMOBILE6 Model

AKMOBILE6 was designed to operate as a "shell" program written around as-released (i.e., unmodified) versions of EPA's MOBILE6 model in order to calculate both initial idling and traveling (i.e., after initial idle) CO emission factors.[11] AKMOBILE6 computes initial idling emission factors and then automatically executes MOBILE6 to calculate traveling emission factors for each input analysis scenario. Both types of emission factors are then combined into a single tabular output file produced by AKMOBILE6. These processes and the program and data flow between AKMOBILE6 and MOBILE6 are summarized in Figure 2-6.

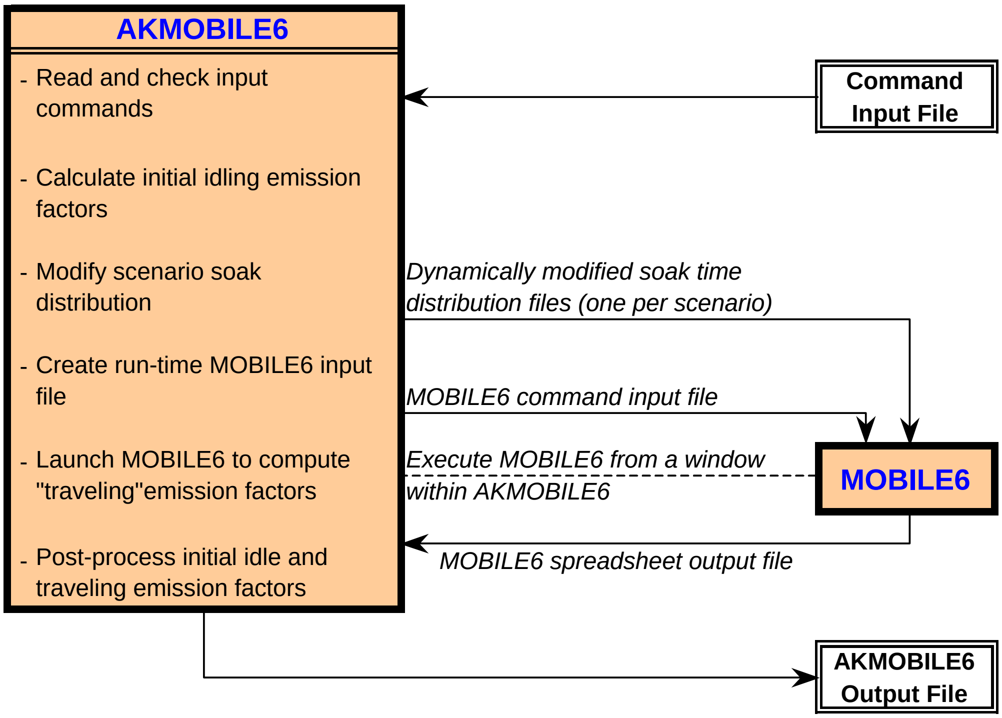
Figure 2-5
AKMOBILE6 Warm-Up Idle Cumulative CO Emission Curves





AKMOBILE6 first inputs and validates the commands in the input file. (AKMOBILE6 uses command inputs similar to MOBILE6.) These command checks ensure that the input file contains only those commands expected by AKMOBILE6 to work properly. Idle emissions are then calculated from curve-fitted test measurements and the length (in minutes) of the initial idling event. For each analysis scenario, the user must define the ambient temperature, the soak time, and the length of the initial idling event for AKMOBILE6 to perform these calculations.

Figure 2-6
Illustration of AKMOBILE6 Program Flow



AKMOBILE6 dynamically creates a series of soak distribution files that reflect the equivalent after-idle soak times for each scenario. It also creates a "run-time" MOBILE6 input file containing "SOAK DISTRIBUTION" commands that invoke these soak distribution files for each analysis scenario. Once these steps are completed, AKMOBILE6 automatically launches MOBILE6 to calculate the traveling emission factors for each analysis scenario. The run-time input file and soak distribution files are fed to MOBILE6 as inputs needed to reflect the "after-idle" thermal state and properly calculate traveling emission factors for each scenario.

After MOBILE6 has completed execution from within AKMOBILE6, post-processing is performed to combine the initial idle emission factors (in grams/trip) computed by AKMOBILE6 with the after-idle traveling emission factors (in grams/mile) calculated by MOBILE6. AKMOBILE6 creates a single output file that displays both of these emission factors for each analysis scenario contained in the input file.

AKMOBILE6 and MOBILE6 Inputs and Assumptions

Trip Types – Input scenarios were created in order to develop emission factors for each trip type defined in Table 2-1 below. As used in this analysis, a trip type refers to unique definitions of preceding soak, initial idle, plug-in use, and trip purpose. A detailed discussion of the development of these trip types was included in the development of the 1995-2001 Fairbanks CO emission inventory.[12] CO emissions from the different trip types are then weighted using distribution factors that represent the fleet characteristics for the Fairbanks nonattainment area.

Ideally, it would be desirable to have specific soak, temperature, plug-in, and idle data available for each individual trip. This is obviously not practical. Therefore, using the limited available data and "reasonable" assumptions, trip purpose groups were subdivided into trip types as shown in Table 2-1. The rationale behind each of these trip types and characteristics is explained as follows.

Table 2-1
Fairbanks Disaggregated Trip Types and Characteristics

Trip Type	Direction	Location	Plug-In?	Soak Time (hrs)	Soak Temp (°F)	Initial Idle (min)
HBW1	Home to Work	Garage	No	10	50	0.5
HBW2	Home to Work	Outside	Yes	10	20	5.0
HBW3	Home to Work	Outside	No	10	20	5.0
HBW4	Work to Home	Outside	Yes	8	20	5.0
HBW5	Work to Home	Outside	No	8	20	5.0
HBW6	Work to Home	Outside	Yes	4	20	5.0
HBW7	Work to Home	Outside	No	4	20	5.0
HBO1	Home to Other	Garage	No	10	50	0.5
HBO2	Home to Other	Outside	Yes	10	20	5.0
HBO3	Home to Other	Outside	No	10	20	5.0
HBO4	Other to Home	Outside	No	2	20	5.0
NHB1	Other to Other	Outside	No	0.5	20	0.5
NHB2	Other to Other	Outside	No	1	20	0.5
NHB3	Other to Other	Outside	No	2	20	1.0

Home-Based Work (HBW) Trip Types – Home-based work trips consist of travel from home to work, or work to home. Because of differences in soak time, these trips had to be split by destination (i.e., work vs. home). It was assumed that all home-to-work trips were preceded by an overnight soak of 10 hours. However, work-to-home trips had to be split into two soak time groups to account for the fact that when midday trips are taken prior to returning home in the evening, the soak time is shorter. Thus, work-to-home trips were split based on 4-hour and 8-hour soak times to properly distinguish the effect of midday trips from the workplace. Home-based work trips were also subdivided to separate trips where plug-ins were used from those that weren't plugged in. Finally, home-to-work trips that originated from a heated garage were also separated from those that were parked outside. (Note that none of these garage-originated trips were assumed to be plugged in since plug-ins are unnecessary in a heated garage.) As shown in Table 2-1, a total of seven HBW trip type categories were defined.

Home-Based Other (HBO) Trip Types – Home-based other trips represent all non-work trips that begin or end at home, such as shopping and school trips. Within this group, trips leaving home were split into three trip type categories to distinguish plug-in use and garaged versus outside parking. Their soak time, temperature, and idling characteristics were assumed to be the same as for the corresponding HBW categories. In the absence of available data, HBO trips returning home were assigned a single category with an assumed soak of two hours in outside ambient conditions. In Fairbanks, plug-in heaters are generally located only in homes or other lodging facilities (e.g., apartments, hotels, etc.) and in workplace parking lots. Thus, for HBO trips returning home with an average two hours soak time, no plugging in was assumed, and it was not necessary to further subdivide this category.

Non-Home-Based (NHB) Trip Types – Non-home-based trips consist of those trips not leaving or returning to home such as a midday errand from work. A total of three categories were used to represent the NHB trip group, based on the prior soak time and initial idling time, as follows:

- 0.5-hour soak and 0.5-minute idle;
- 1-hour soak and 0.5-minute idle; and
- 2-hour soak and 1-minute idle.

These NHB trip type categories were defined based on guidance from ADOT&PF[13] to reflect typical, reasonable soak and idling characteristics of non-home-based "errand" trips. All NHB trips were assumed to be distributed 50%, 30%, and 20% into each of these three categories, respectively.

Each modeling scenario written for each trip type reflects an ambient temperature equivalent to the soak temperature indicated in Table 2-1 above. Although recorded ambient temperatures during CO exceedances in Fairbanks since 1996 have been below 20°F in all cases, the temperature correction factors in MOBILE are based on test data collected at 20°F and above. MOBILE6 can be executed for input temperatures below 20°F; however, the emission factor outputs at these temperatures have never been validated against real data. Thus, due to possible errors in outputs below 20°F, all cold-start scenarios were performed at 20°F.

Other parameter inputs to the model were developed from local Fairbanks fleet data where available and are described separately below.

<u>Vehicle Age Distributions</u> – The 1998-99 idle testing study sampled a target distribution of vehicles based on a combination of Department of Motor Vehicle (DMV) registration data and related travel activity information. During the course of that study, it became evident that older vehicles were not being operated during the winter anywhere near the levels suggested by registration data. To confirm this suspicion, ADEC conducted detailed parking lot surveys during the winters of 1999 and 2000 in both Anchorage and

Fairbanks and again in both communities in 2005. Based on an analysis of available registration data, confidence limits for alternate sample sizes were defined for each community. As a result, large surveys (on the order of 5,000+ vehicles) were collected for each community to ensure high levels of precision and confidence in the collected data sets. The results of the most recent 2005 parking lot surveys was used to quantify the Fairbanks vehicle age distribution of gasoline-powered cars and light-duty trucks. Default values within the MOBILE6 model were used to characterize the age distribution of Diesel-powered vehicles and heavy trucks classifications.

Mileage Accumulation Rates – Mileage accumulation rates (i.e., the annual mileage driven as a function of vehicle age) for vehicles subject to I/M were determined based on the six* most recent years of available I/M data supplied by ADEC. MOBILE-based vehicle type of each vehicle was determined by matching the VINs included in the I/M database to VIN-decoded DMV records also supplied by ADEC (and described in greater detail later in the "Fleet VMT Mix" subsection). Records for failing tests in the I/M database were deleted so that the time and odometer readings between passing tests could be calculated. Since the date of first service for each vehicle was unknown, a date of entry into service of April 1 of the model year of the vehicle was assumed. Then all passing tests for each vehicle, by VIN, were put in time order based on date, and the differences in date and odometer readings were used to calculate the annual mileage accumulation rates. The mileage accumulation rates by vehicle type were then reported by model year.

The resulting data were tabulated by vehicle class and age (in years). Since vehicle age was based on an assumed April 1 entry into the fleet for each model year and MOBILE6 expects input mileage rates to reflect fleet conditions as of July 1, age-specific multipliers were used to adjust the tabulated mileage accumulations to reflect a July 1 fleet. For example, mileage rates for Age 2 vehicles were multiplied by a factor of 24/15 to reflect the difference between mileage accumulated over a full two-year period (24 months) and the number of months (15 months) between the assumed fleet entry date April 1 (of previous year) and the MOBILE6 input data (July 1 of current year). Age 3 mileages were adjusted by a multiplier of 36/27 and so on. (There were insufficient data to estimate mileage accumulation for Age 1 vehicles due to new model year exemptions from I/M tests.)

An exponential function of the following form was used to curve-fit the adjusted mileage rates by age:

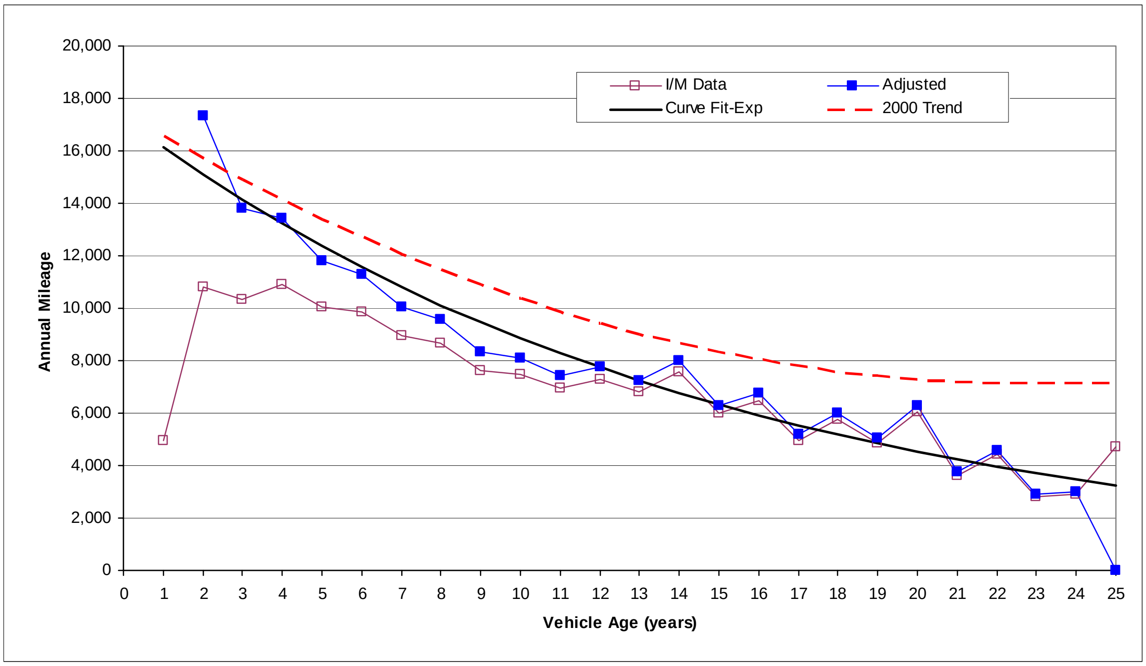
$$MAR = C_0 \times C_1^{AC_2}$$

* I/M tests in Fairbanks are generally conducted biennially (i.e., every other year). At a minimum, two to three years of I/M data are sufficient to capture the amount of mileage accumulated between I/M tests, based on odometer readings recorded during each inspection. A broader, six-year sample of data was used in order to capture multiple I/M "cycles" for each vehicle. Because odometer readings are often mistyped or odometer rollover is not accounted for (i.e., in older vehicles with 5-digit odometers), the availability of odometer readings over multiple cycles enabled clearer identification and correction of odometer entry anomalies.

where *MAR* is the curve-fitted annual mileage rate, *A* is vehicle age in years and C_0, C_1 and C_2 are coefficients determined by least-squares estimation.

Figure 2-7 presents the resulting curve-fitted mileage accumulation rates (displayed as a solid black line) determined for Fairbanks light-duty gasoline vehicles (LDGVs). The correlation (R^2) for this curve was 0.944. The red dashed curve in Figure 2-7 is the curve-fitted mileage accumulate rate used in the 2004 Maintenance Plan inventories,[2] which was based on older I/M and DMV data from calendar year 2000. (In these earlier datasets, the VINs were decoded to an accurate representation of vehicle type as was performed for this effort.) A significant difference in mileage rates for older vehicles is seen between these two curves in Figure 2-7. The newer, more robust data employed in this analysis exhibit much less annual mileage accumulation after about ten years.

Figure 2-7
Fairbanks LDGV Annual Mileage Accumulation Rates



Similar curve fits and correlations were found for the light- and heavy-duty gasoline truck vehicle classes, showing decreasing mileage accumulation rates with age.

Since heavier vehicles (> 12,000 lb GVWR) and Diesels do not participate in the I/M program, mileage accumulation rates for these vehicles could not be determined from I/M data. Default mileage accumulation rates from MOBILE6 were used for these vehicles.

Fleet VMT Mix – An effort was made to use DMV records for classifying the Fairbanks fleet by vehicle class (as indicated using the "Class_Code" and "Emission_Control" and "IM_Required" fields in the DMV record) and to combine the results with the mileage accumulation rates obtained previously in order to estimate the fleet VMT distribution. (ADEC provided a statewide DMV database as of June 2006 for the analysis.) However, the DMV vehicle class records were found to be inaccurate, as they tended to classify some light-duty trucks as passenger cars. Consequently, this approach overstated the VMT fraction for LDVs (passenger cars) and understated it for LDTs.

In order to address these shortcomings, the Fairbanks fleet mix was more robustly determined by running the VINs in the DMV database through a VIN "decoder" that ADEC licensed from ESP Data Solutions, Inc.* The ESP decoder works for all vehicle classes, heavy-duty vehicles and Diesels included. Its outputs include fuel type and GVWR,† which can be directly translated into the eight-category MOBILE5b vehicle class scheme. ADEC agreed to run the VINs through the ESP decoder. Use of the ESP decoder produced more reasonable estimates of population fractions for LDVs and LDTs.

A translation utility spreadsheet developed by Sierra based on guidance in EPA's MOBILE6.2 User's Guide was then used to translate the population fractions from the eight-category MOBILE5b scheme into the 16 vehicle classes employed in MOBILE6.2 (and AKMOBILE6).

The VIN-decoded vehicle populations were then combined with mileage accumulation rates for each MOBILE6 vehicle class and used to calculate normalized fleet VMT mix fractions. Motorcycles were not assumed to operate during wintertime (consistent with existing SIP modeling). Thus for the wintertime fleet, the population fractions were re-normalized after motorcycles were removed. Table 2-2 shows the resulting wintertime fleet VMT mix used to calculate on-road vehicle emissions in Fairbanks.

Calendar Year – As discussed earlier, the base year for the analysis was 2005. Since the MOBILE6 runs were performed for a January fleet to reflect wintertime conditions, base year 2005 refers to a January 1, 2006 MOBILE6 fleet. Model runs were also performed reflecting the winter of 2005 (January 2006) through the winter of 2015 (January 2016). To avoid confusion, MOBILE6 runs are named based on the winter year. In other words, a Wintertime 2005 run was represented by January 2006 fleet inputs and so on.

I/M Program Characteristics – I/M inputs to the MOBILE6 model were specified to represent the biennial decentralized two-speed idle/OBD testing and repair program currently in place in Fairbanks. Light-duty gasoline vehicles, light-duty gasoline trucks, and heavy-duty gasoline vehicles up to 12,000 lb from model year 1975 and newer are tested using the two-speed idle test. Starting in mid-2001, 1996 and newer light-duty gasoline vehicles were given OBD II checks. Consequently, model runs for calendar years 2005-2015 reflect the full benefits of OBD.

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* Sierra evaluated the ESP decoder for EPA several years ago and had found it to be one of the most accurate and extensive commercially available VIN decoders at that time.

† The ESP decoder outputs GVWR in 1,000-lb-wide intervals between 6,000 and 10,000 lb. Analysis of a number of individual vehicle models by Sierra indicated that vehicles listed in the 8,000-9,000 lb GVWR class were always above the 8,500 lb cutoff between light- and heavy-duty vehicles. Thus, the ESP decoded outputs of GVWR and fuel type could be directly mapped into the MOBILE5b vehicle classes.

Table 2-2 **Fairbanks VMT Distribution**	
Vehicle Class	VMT Fraction
LDV	0.2765
LDT1	0.0681
LDT2	0.2267
LDT3	0.1253
LDT4	0.0576
HDV2B	0.0793
HDV3	0.0078
HDV4	0.0063
HDV5	0.0047
HDV6	0.0176
HDV7	0.0208
HDV8A	0.0227
HDV8B	0.0808
HDBS	0.0040
HDBT	0.0018
MC	0.0000
Total	1.0000

All vehicles subject to I/M are also given comprehensive visual and functional checks. In an earlier I/M SIP modification, ADEC claimed that the decentralized test and repair program was achieving 85% of the I/M and ATP credits allowed for a centralized test-only program.[*] However, due to program revisions implemented in January 2000,[†] calendar year 2005 and later runs assumed 100% I/M and ATP effectiveness. Based on analysis of 2005 vehicle parking lot survey data, a compliance rate of 96% was assumed for all calendar year 2005 and later runs. The I/M grace period or new model year exemption for four-year-old or newer vehicles was also modeled in this analysis. (The 2004 Maintenance Plan inventories employed a two-year grace period which was in place at that time.)

One limitation inherent in the design of MOBILE6 is the inability to distinguish whether some vehicles older than 25 years of age are subject to an I/M program. The model automatically lumps all vehicles that are 25 years old or older into one group and applies the same emission factor distribution, deterioration rates, mileage accumulation, and I/M rules to all vehicles in that group. Consequently, this procedure overestimates the benefits due to I/M for Fairbanks. In Fairbanks, vehicles older than model year 1975 (31 years old in calendar year 2006) are not subject to I/M. In order to account for this limitation, an analysis was performed to estimate the I/M benefits allotted by MOBILE6

[*] Alaska State Implementation Plan I/M Credit Submission, March 27, 1996.
[†] A detailed discussion of the basis for this assumption is presented in the attainment demonstration.

to the vehicles older than 1975, and these benefits were removed from the final inventories. A discussion of this analysis is included in the end of this section.

Fuel Sulfur – Estimates for the fuel sulfur levels in 2005 and 2006 were obtained from tests performed by Flint Hills Resources on tank fuel during the 2005-06 Low Sulfur Gasoline study.[14] Thereafter, the sulfur levels for the "Conventional Gasoline West" MOBILE6 default were used. The sulfur levels used in the modeling runs by calendar year are shown in Table 2-3 below.

Table 2-3
Fairbanks Fuel S2--Sulfur Levels

Calendar Year	Avg Sulfur (ppm)	Max Sulfur (ppm)
2005	164	200
2006	164	200
2007	60	80
2008 and Later	30	80

Vehicle Speeds – The Alaska Department of Transportation and Public Facilities (ADOT&PF) supplied vehicle speed estimates for the Urban nonattainment area of the Borough. The speed estimate supplied by ADOT&PF was simply an average travel speed for the area. This was approximately 35.7 mph for the Fairbanks Urban area for 2005–2015.

Supplemental FTP Flag – Driving data collected in Alaska indicated that no off-cycle driving activity was observed under wintertime road conditions. Thus, the option within MOBILE6 to disable off-cycle driving emissions was used to exclude the effects of supplemental FTP controls that are not applicable to wintertime Alaska driving.

Reid Vapor Pressure (Rvp) – The MOBILE6 model does not correct for the effect of Rvp at temperatures below 40° F. Since wintertime Fairbanks ambient temperatures are well below that level, the Rvp value input to the model is immaterial. Regardless, the actual winter fuel Rvp value of 14.7 psi was used.

Altitude – Fairbanks was modeled as a low-altitude region.

The descriptions presented above provide a narrative summary of each of the inputs supplied to the MOBILE6 model to generate emission factors for the traveling portion of each trip type in the on-road vehicle inventory. Printouts of the detailed input files used to perform the model runs are provided in Appendix A.

After emission factors for the initial idle and travel portions of each trip were developed, the results were combined with the travel assumptions obtained from ADEC for

Fairbanks. These travel assumptions include the trip-type distributions and trip-count assumptions specific to the Urban area of Fairbanks. These are discussed in detail below.

Fairbanks Travel Assumptions

In order to estimate the mobile source inventory in the Fairbanks Urban area, the initial idle and traveling emission factors developed for each of the trip types using AKMOBILE6 and MOBILE6 were combined with estimates for the local daily vehicle miles traveled (VMT) and daily trip totals for each calendar year. Estimates of average winter weekday vehicle VMT by calendar year from 2000 through 2015 and in 2025 for the Fairbanks Urban area were supplied by ADOT&PF[15] from its Long-Range Transportation Plan (LRTP) ADOT&PF also supplied estimates of vehicle trips in years 2002, 2006, 2010, 2015 and 2025 and population (persons) in 2000 and 2025.

Vehicle activity data (VMT and trips) were needed for each year from 2005-2015 in order to generate the on-road CO inventories. VMT forecasts were available for each calendar year from ADOT&PF. However, vehicle trips were computed for intervening years between those where LRTP estimates were available by assuming a constant growth rate in trips.

Although person population forecasts were not needed to compute on-road emissions, population estimates by year (which were used for other source categories) were interpolated from the VMT estimates. This interpolation approach and the results are thus presented here. Year-by-year population from 2005–2015 was calculated by interpolating the LRTP populations given for 2000 and 2025 using amount of VMT change in a given year (relative to the overall change between 2000 and 2025). For example, daily VMT in 2010 was forecast by ADOT&PF to be 917,126, which is 42% of the total increase in VMT between 2000 (743,083) and 2025 (1,153,406). Given LRTP populations in 2000 and 2025 of 39,170 and 50,400, respectively, population in 2010 was then interpolated by applying this percentage to the incremental change in population between 2000 and 2025 from the LRTP as follows:

$$39{,}170 + [42.4\% \times (50{,}400-39{,}170)] = 43{,}933$$

Results of the calendar year interpolations of vehicle trips and populations along with the Fairbanks Urban area VMT are presented in Table 2-4. Values shown in blue italics are interpolated; those in black were supplied directly by ADOT&PF. Although Table 2-4 shows results for 2000 through 2025 to illustrate where values were interpolated, only the results from 2005 through 2015 were used for the CO inventories. According to the data, VMT is projected to grow at a rate of just under 2% per year from 2005 to 2015. Similar, but slightly lower, growth rates are projected for trips and population.

Table 2-4 **Fairbanks Urban Daily Winter VMT, Vehicle Trips, and Population (persons) by Calendar Year**			
Calendar Year	Daily VMT	Vehicle Trips	Population
2000	743,083	-	39,170
2001	*749,841*	-	39,356
2002	*756,661*	221,845	39,543
2003	*763,543*	*228,883*	39,731
2004	770,488	*236,145*	*39,920*
2005	816,616	*243,637*	*41,183*
2006	862,743	251,367	*42,445*
2007	876,029	*255,238*	*42,809*
2008	889,519	*259,168*	*43,178*
2009	903,217	*263,159*	*43,553*
2010	917,126	267,212	*43,933*
2011	931,249	*271,327*	*44,320*
2012	945,590	*275,505*	*44,712*
2013	960,151	*279,748*	*45,111*
2014	974,937	*284,056*	*45,516*
2015	989,950	288,430	*45,926*
2016	1,005,195	*292,872*	*46,344*
2017	1,020,674	*297,382*	*46,767*
2018	1,036,392	*301,961*	*47,197*
2019	1,052,352	*306,611*	*47,634*
2020	1,068,557	*311,333*	*48,078*
2021	1,085,012	*316,127*	*48,528*
2022	1,101,721	*320,995*	*48,985*
2023	1,118,687	*325,938*	*49,450*
2024	1,135,914	*330,957*	*49,921*
2025	1,153,406	336,054	50,400

Note: Values shown in blue italics are interpolated; those in black were supplied directly by ADOT&PF.

The total annual VMT and vehicle trips were divided among the different trip-types shown in Table 2-1 using a distribution designed to represent Fairbanks Urban fleet activity. ADOT&PF generated estimates for the travel characteristics and distribution of trips by general trip purpose (HBW, HBO, or NHB), and FNSB staff conducted field surveys of parking lots to determine initial idle durations and extent of plug-in availability and use. Data from these efforts were then used to develop the Fairbanks Urban area trip-type distributions shown in Table 2-5.

Table 2-5 Fairbanks Urban Area Vehicle Trip Type Distribution						
Trip Type	Soak Location	Plug-In?	Soak Time (hrs)	Soak Temp (°F)	Initial Idle (min)	Trip Type Fraction
HBW1	Garage	No	10	50	0.5	0.120
HBW2	Outside	Yes	10	20	5.0	0.020
HBW3	Outside	No	10	20	5.0	0.010
HBW4	Outside	Yes	8	20	5.0	0.041
HBW5	Outside	No	8	20	5.0	0.022
HBW6	Outside	Yes	4	20	5.0	0.057
HBW7	Outside	No	4	20	5.0	0.030
HBO1	Garage	No	10	50	0.5	0.200
HBO2	Outside	Yes	10	20	5.0	0.034
HBO3	Outside	No	10	20	5.0	0.016
HBO4	Outside	No	2	20	5.0	0.250
NHB1	Outside	No	0.5	20	0.5	0.100
NHB2	Outside	No	1	20	0.5	0.060
NHB3	Outside	No	1	20	1.0	0.060

Forecasting AKMOBILE6 Idle Emissions

The measured initial idling emissions from the Alaska testing programs represent a "snapshot" in idle emission levels that existed in the vehicle fleet at the time testing was conducted. In future calendar years, initial idling emission levels of the vehicle fleet are expected to be lower than those tested in the 2000 timeframe due to continuing emission control technology improvements. Thus, it was necessary to include an element in AKMOBILE6 that accounted for the combined effects of technology improvements and fleet turnover in estimating initial idle emission levels for calendar years beyond 2000.

Future year idle emissions in AKMOBILE6 were modeled using a series of scaling factors based on outputs from MOBILE6. The base emission rate equations in MOBILE6 include the effects of in-use emissions deterioration and improvements from introduction of cleaner technologies in future model years. Although MOBILE6 cannot generate actual idle emission factors, the model was run using the following input parameters to simulate cold start "idle" per EPA guidance:

- 2.5 mph vehicle speed,
- 100% arterial travel,
- Cold start (100% operation with 12-hour soak), and
- No I/M (to eliminate the effect of I/M in determining idle ratios).

Using Alaska-specific mileage accumulation rates and registration distributions, a series of MOBILE6 runs were generated by calendar year for calendar years 2000 through 2020. Scaling factors for future calendar years after 2000 were developed for each light-duty gasoline vehicle class from these outputs. The scaling factors were normalized to a 2000 "base" year.

Table 2-6 shows these MOBILE6-based ratios. They were incorporated into AKMOBILE6 and used to determine initial idle emission factors by vehicle class for calendar years from 2001 through 2020. This was done by scaling the calendar year 2000-based idle emissions calculated earlier in AKMOBILE6 as a function of soak time, initial idle time, and temperature with vehicle-class-specific factors for the future calendar year being modeled.

Table 2-6
MOBILE6-Based Future Year Idle Scaling Factors

Calendar Year	Idle Ratios By Vehicle Class				
	LDGV	LDGT1	LDGT2	LDGT3	LDGT4
2000	1.000	1.000	1.000	1.000	1.000
2001	0.944	0.933	0.933	0.929	0.930
2002	0.898	0.878	0.872	0.860	0.861
2003	0.864	0.827	0.816	0.753	0.755
2004	0.761	0.749	0.737	0.684	0.686
2005	0.748	0.685	0.671	0.625	0.628
2006	0.743	0.656	0.639	0.593	0.595
2007	0.640	0.570	0.563	0.532	0.534
2008	0.582	0.498	0.499	0.481	0.483
2009	0.563	0.468	0.469	0.451	0.453
2010	0.543	0.434	0.434	0.417	0.419
2011	0.523	0.404	0.404	0.389	0.391
2012	0.505	0.373	0.373	0.359	0.362
2013	0.495	0.356	0.355	0.341	0.344
2014	0.485	0.344	0.343	0.328	0.330
2015	0.477	0.334	0.332	0.317	0.319
2016	0.469	0.321	0.319	0.304	0.306
2017	0.462	0.313	0.311	0.296	0.298
2018	0.456	0.302	0.300	0.286	0.288
2019	0.451	0.295	0.293	0.278	0.280
2020	0.448	0.290	0.288	0.273	0.275

For example, assume an input calendar year of 2005 and a trip scenario characterized by a 12-hour soak and 3 minutes of initial idle. Further assume the "base" idle emissions for LDGVs under this trip scenario calculated within AKMOBILE6 from the 2000 fleet-based warm-up curves was 90 grams/trip of CO. Using the scaling factors as shown in Table 2-6, AKMOBILE computes calendar year 2005 idle emissions for LDGVs under this trip scenario as 64.3 grams/trip (90 × 0.748).

AKMOBILE6 Plug-In Benefits

The 1998-99 and 2000-01 studies generated paired plug-in vs. no plug-in test data for 37 vehicles. Moreover, the 31 paired tests from the 2000-01 study consisted of a 10-minute warm-up idle followed by the Alaska Driving Cycle (ADC), a transient stop-and-go driving cycle that represents wintertime driving patterns in Alaska as described earlier. Consequently, the effect of plugging in prior to a trip was measured during both the initial idle and traveling portion of the trip. Thus, AKMOBILE6 includes separate plug-in benefits for both initial idling and traveling, each of which is discussed separately below.

Plug-In Idle Emission Benefits - With the data sample size, it was possible to develop estimates of plug-in idle benefits separately by model year range. These plug-in idle benefits are shown in Table 2-7. They were calculated by taking means of cumulative 10-minute warm-up idle emissions of paired tests (i.e., "with plug-in" and "no plug-in") in each model year range and computing the emission reduction percentage between the paired sample means.

Table 2-7
AKMOBILE6 Plug-In Idle CO Benefits (%) by Model Year Range

Model Year Range	Sample Size	Plug-In Benefit (%)
Pre-1988	4	74.8%
1988-1993	13	36.9%
Post-1993	20	52.2%

The individual paired tests in each model year range were also examined to identify reasons for the lower percentage benefits in the later model year ranges. Sierra identified 2-4 paired tests in the 1988-1993 and Post-1993 model year range groups that showed little change or even a slight increase (less than 15%) in cumulative 10-minute idle emissions when plugged in. After some consideration, it was believed that these apparent anomalies could have been the result of faulty circuits in the heater plugs of those vehicles, making them unable to warm the engine block. (None of these instances were observed in the original six-vehicle sample.) These instances are likely to occur over a broader sample of the in-use fleet. Thus, a decision was made to retain these tests in the analysis sample in order to better represent actual in-use fleet plug-in benefits. Hence, the plug-in idle benefits in AKMOBILE6 reflect the fact that some vehicles, despite plugging in, get little or no benefits because of a non-working plug-in connection.

Statistical T-tests were also conducted on the data in each model year range group to determine the statistical significance of the mean benefits of each group. In all cases of pooled T-test comparisons between each of the three groups, the differences in mean benefits in each group were statistically significant (at 95% probability or greater). Thus, the separate benefits by model year range shown in Table 2-7 were included in AKMOBILE6, rather than averaged together across all model years.

(An enhancement was also made to AKMOBILE in July 2004 after completion of the earlier 2004 Maintenance Plan that also scaled the plug-in idle benefits listed in Table 2-7 by the initial thermal state of the vehicle scenario being modeled. The plug-in benefits in Table 2-7 reflect a completely cold thermal state. The enhanced logic in AKMOBILE6 linearly scales these plug-in idle benefits as a function of the initial thermal state.)

Plug-In Traveling Emission Benefits – In addition to the warm-up idle, transient emissions measured over the subsequent stop-and-go ADC cycle with and without prior plug-in were used to develop a separate estimate of plug-in benefits for the remaining traveling portion of a vehicle trip that follows initial idling.

Since ADC tests were available only from the more recent 2000-01 testing program and several ADC tests were invalidated (e.g., due to driving outside the driving trace) in the paired plug-in vs. no plug-in testing, a total of 26 valid paired tests were available for this analysis, with only a single vehicle from the pre-1988 model year range. Thus, although an approach similar to that employed in calculating plug-in idle benefits was used, plug-in traveling benefits were computed by combining the available data across all model year ranges.

Mean ADC emissions from all paired tests with and without plug-in tests were computed as 72.2 grams and 57.5 grams for without plug-in and with plug-in tests, respectively. The percentage reduction in traveling emissions from plug-ins was then calculated from these paired means as 20.4% (i.e., [72.2-57.5]÷72.2). Thus, AKMOBILE6 includes a 20.4% traveling emissions benefit for plug-ins.

I/M Benefits for Vehicles Older than Model Year 1975

For the earlier 2004 Maintenance Plan, separate MOBILE6 runs were executed in order to estimate the benefits unnecessarily allotted by MOBILE6 for the I/M testing of vehicles that are 1974 and older in Fairbanks since it groups all model years older than 24 years into a single category. The model was run with and without I/M in order to estimate the benefits of I/M for each model year grouping. The I/M benefits (without-I/M CO minus with-I/M CO in g/mi) found for the oldest model year grouping (25 years old and older) were then multiplied by a factor representing the percentage of vehicles that are 1974 and older. An analysis of vehicle registration data obtained in 2000 from ADEC revealed that approximately 32% of the vehicles that were at least 25 years old (MY 1981 and older) were older than 1975. This resulted in an estimate for the benefits of I/M for vehicles that are 1974 and older in grams of CO per mile. The I/M benefit per mile was multiplied by the average daily VMT for 2004 to estimate the tonnage benefit. The benefit of I/M testing vehicles that are 1974 and older was estimated in the 2004 Maintenance Plan to be 0.10 tons of CO per day (tpd) in 2004.

Given the magnitude of this correction and the fact that the pre-1975 vehicles represent an even smaller faction of the on-road vehicle fleet today, a similar correction was ignored for this effort.

On-Road Emissions Summary

Table 2-8 summarizes the initial idling and after-idle traveling on-road mobile source CO emissions in the Fairbanks Urban area that were calculated using the methodology and travel data discussed in the preceding sections. Emissions are shown by winter year (i.e., winter of 2005 represents January of 2006). As seen in Table 2-8, initial idling emissions contribute substantially to total on-road CO emissions. This is the result of both the amount of idling that occurs in Fairbanks during wintertime conditions and the fact that much of the engine and catalyst warm-up occurs during this initial idling.

Table 2-8
Fairbanks Urban Area Mobile Source CO Emissions (tons/day)

Winter Year	Initial Idle CO	Traveling CO	Total CO
2005	7.45	17.83	25.29
2006	6.74	16.39	23.13
2007	6.14	15.12	21.26
2008	5.92	14.36	20.28
2009	5.65	13.60	19.25
2010	5.66	15.65	21.31
2011	5.40	15.17	20.56
2012	5.28	14.77	20.05
2013	5.20	14.51	19.71
2014	5.15	14.32	19.47
2015	5.07	14.12	19.18

The on-road mobile source emissions shown in Table 2-8 were then integrated into the overall CO emissions inventory to perform the attainment determination.

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3. NON-ROAD SOURCE EMISSIONS

In recent years there has been a substantial increase in the attention devoted to modeling emissions for the non-highway mobile source emissions. Several models have been developed to estimate emissions from the range of vehicles and equipment included in this category. Presented below are separate discussions of the data, methodologies, and results for the non-road and aircraft operations models employed in this analysis. No information on vessel emissions is presented, as they do not operate in the arctic conditions experienced in Fairbanks during the winter.

Non-Road Vehicle Emissions

The U.S. EPA categorizes manmade emissions into three broad categories: mobile sources, stationary (or point) sources, and area sources. Mobile source emissions are further subdivided into two more categories: on-road (e.g., cars trucks, and motorcycles), and non-road emission sources. Non-road sources include a varied assortment of equipment, which can be generally categorized as follows:

- Recreational vehicles (e.g., all-terrain vehicles and off-road motorcycles);
- Logging equipment (e.g., chain saws);
- Agricultural equipment (e.g., tractors);
- Construction equipment (e.g., graders and backhoes);
- Industrial equipment (e.g., forklifts and sweepers);
- Residential and commercial lawn and garden equipment (e.g., leaf and snow blowers);
- Recreational and commercial marine vessels (e.g., powerboats and oil tankers);[*]
- Locomotive equipment (e.g., train engines and support equipment); and
- Aircraft (e.g., aircraft and ground support equipment).

It is important to note that with the exception of aircraft, none of the non-road vehicles and equipment listed above were federally regulated until the mid-1990s.

With the exception of the locomotive and aircraft categories, all non-road emissions shown in this section were calculated using EPA's NONROAD model.[†] The

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[*] Although they will be included in the final version of the model, the current draft version of the NONROAD model is not capable of modeling emissions from oil tankers or other comparably large vessels, train engines, or aircraft.
[†] U.S. EPA NONROAD Model, Version 2005a, released February 2006.

NONROAD default equipment populations are based on national averages, then scaled down to represent smaller geographic areas on the basis of human population and proximity to recreational, industrial, and commercial facilities. EPA recognizes the limitations inherent in this “top-down” approach, and realizes that locally generated inputs to the model will increase the accuracy of the resulting output. Therefore, in some cases, locally derived inputs, which more accurately reflect the equipment population and wintertime activity levels in the Fairbanks area, were substituted for EPA’s default input values. Locomotive and aircraft emissions were calculated separately, as discussed later in this section, and are also based on locally generated activity estimates.

Human population data provided by the Alaska Department of Transportation (ADOT) staff were used in several parts of this analysis to adjust assumed equipment population assumptions from the NONROAD model, and to provide a means of separating urban FNSB emissions from the FNSB-area emissions total.

As shown in Table 3-1 below, the Fairbanks urban nonattainment area population has shown a gradual decrease over the past decade – a trend that is predicted to continue through 2015.

Table 3-1
Fairbanks Long-Range Travel Plan Population Data

Calendar Year	Fairbanks Borough Population	Fairbanks Nonattainment Area Population	Annual Percent Population Increase
2004	87,560	39,920	
2005	90,244	41,183	3.16%
2006	91,017	42,445	3.07%
2007	91,802	42,809	0.86%
2008	92,599	43,178	0.86%
2009	93,409	43,553	0.87%
2010	94,230	43,933	0.87%
2011	95,065	44,320	0.88%
2012	95,912	44,712	0.89%
2013	96,773	45,111	0.89%
2014	97,646	45,516	0.90%
2015	87,560	45,926	0.90%

Note that with the exception of aircraft and snowmobiles, both of which are discussed in detail below, the total FNSB emissions from each nonroad source have been allocated to the urban nonattainment area according to the 2005-2015 population distribution shown in Table 3-1 (i.e., 47% of the total FNSB emissions were allocated to the urban nonattainment area).

Calculation Methodology - EPA's NONROAD emissions model calculates emissions from each source according to the following methodology:

Emissions = EF x DF x P x LF x Hours x Units

where EF = emission factor in g/hp-hr
DF = deterioration factor (dimensionless)
P = power in horsepower
LF = load factor (dimensionless)
Hours = annual operating hours for each unit
Units = total population of engines operating in a given year

The above calculation yields emission results in grams per year, which the model then converts to tons. For seasonal or daily emissions estimates, the calculated annual emissions for each source are then distributed over a given number of calendar months. For example, EPA assumes that all snowmobile activity takes place during the winter months, which are defined by the model to be December, January, and February. For this analysis, the seasonal distribution, as well as the annual operating hours and equipment populations, was modified for a number of specific equipment types. Summarized below are the equipment-specific modifications made to EPA's default NONROAD Model inputs.

Snowmobiles – Modifications made for snowmobiles are outlined below.

- Population – The current version of EPA's NONROAD model predicts a population of 8,216[*] snowmobiles in Fairbanks for CY 2000. However, information supplied by ADEC[†] indicates that the Fairbanks snowmobile population for that year was actually 10,570 units. The ADEC estimate is based on the number of registered snowmobiles (5,285 units), which was then doubled to account for unregistered machines. The Alaska State Motor Vehicles Division requires snowmobile owners to register their machines annually and is responsible for enforcing that requirement. However, due to the limited number of personnel available for registration enforcement patrol and the immense land area available for snowmobile use in the areas surrounding Fairbanks, FNSB staff feels that only about half of the machines in use are actually registered.

- Activity – Snowmobile use inside the urban nonattainment area is largely banned[‡] because of public safety ordinances that prohibit their use on public trails and on public roadways. Therefore, FNSB staff has assumed an activity estimate of 1 hour/year/unit within the urban nonattainment area to account for loading, unloading, and maintenance. All other snowmobile activity is assumed to occur in areas outside the Borough and/or the nonattainment area. It should be noted

[*] In the original version of the NONROAD Model (version 2.1 with June 2000 updates), the total FNSB snowmobile population estimate was 559.
[†] Personal Communication. Alice Edwards (ADEC) to Lori Williams (Sierra Research), July 19, 2000.
[‡] Personal Communication. Glenn Miller (FNSB) to Richard Joy (Sierra Research), February 1, 2001.

that EPA's estimate of annual snowmobile activity for all regions is 57 hours/year/unit.

Given the above, we have modified EPA's default model inputs for snowmobiles as follows:

- The CY 2000 FNSB snowmobile population was increased from 8,216 to 10,570;

- The entire snowmobile population is operated one hour per year within the urban nonattainment area; and

- The calculated annual snowmobile emissions are evenly distributed over the seven-month period from October through April.

Snowblowers – For purposes of this analysis, emissions from this equipment source are considered to be zero. CO violations (and consequently, CO design days) always occur when there is a strong inversion layer over the region, rather than during periods of snow activity when snowblowers are typically used. Therefore, since snowblowers are not typically in use on the CO design day, we have discounted their emissions from this analysis.

Air Compressors – According to FNSB staff, there are approximately 10 air compressors currently operating in the Borough during the winter because construction activity during the winter drops dramatically.[*] Therefore, the calendar year 2000 population of air compressors, which the NONROAD model assumes is approximately 400, was adjusted to 10 units.

Nonexistent Wintertime Activity – Due to the severe outdoor weather conditions present in Fairbanks during the winter months, FNSB staff has determined that there is zero wintertime activity for a number of different equipment categories. Therefore, all activity and corresponding emissions for the following nonroad equipment categories have been removed from this analysis:

- Lawn and Garden;
- Agricultural Equipment;
- Construction and Mining;
- Logging Equipment;
- Pleasure Craft (i.e., personal watercraft, inboard and sterndrive motor boats);
- Selected Recreational Equipment (i.e., golf carts, ATVs, off-road motorcycles); and
- Commercial Equipment (i.e., generator sets, pressure washers, welders, pumps, A/C refrigeration units).

Locomotives – Although the NONROAD model calculates emissions from "Railroad Maintenance Equipment," it does not estimate emissions from the locomotive engines

[*] Personal communication between Max Lyon (FNSB) and Bob Dulla (Sierra Research).

themselves. Therefore, emissions based on locomotive activity use were calculated separately.

Locomotive emissions estimates are based on the total gallons of fuel used annually. EPA has published emission factors[16] (in units of pounds of CO per gallon of fuel used) that supersede those in AP-42, and that list separate emission factors for line-haul and switching (or yard) operation as shown below.

- Line-Haul Emission Factor: 58.6 lbs CO/1000 gallons of fuel burned
- Yard Consumption Emission Factor: 83.9 lbs CO/1000 gallons of fuel burned

Locomotive fuel consumption data by locomotive type were supplied by the Alaska Railroad (ARR) for the calendar year 1999. Estimates of yard operation fuel consumption were based on the number of shifts worked and gallons consumed per shift by locomotive type. Estimates of line-haul fuel consumption were based on estimates of ton-miles traveled within the Borough boundaries and gallons of fuel consumed per ton-mile of operation. Fuel use for 1999 was estimated to be 403,000 gallons for yard consumption, and 59,000 gallons for line-haul consumption. Fuel use data were only available for calendar year 1999.[*] Therefore, the emission estimates presented in this analysis are based on the calculated 1999 emissions, adjusted by the annual population growth rates shown above in Table 3-1.[†]

Airport Emissions

The Fairbanks North Star Borough serves as a business and transportation hub for interior Alaska. As such, and with terrain conditions sometimes being inhospitable to motor vehicle travel, commuting by aircraft is commonplace. The airfields at Fort Wainwright Air Force Base (FBK) and Fairbanks International Airport (FAI), which serves several major airlines, as well as commuter travel bound for the smaller towns within the Borough, are located within the nonattainment/urban area. Clearly, air traffic is of concern as it pertains to air quality in the area. Estimates of the typical winter day CO inventories were generated for FAI and FBK for calendar year 2005 and projected to 2015 using local data from the different facilities.

The methodologies used to calculate aircraft and related ground support equipment emissions in the earlier 2004 Maintenance Plan were revised as follows under this effort:

- A newer version of EDMS model was used;
- Existing and forecasted activity levels were updated based on airport records and contacts[‡] at both airports; and

[*] Efforts made to obtain more current locomotive fuel use data from AAR were not successful.
[†] Note that for calendar years 2000 through 2004, a nonattainment population growth rate of 0.70% per year was assumed, which is based on U.S. Census Data, as well as information provided by FNSB staff.
[‡] Alan Braley (Fairbanks International Airport) and Eric Dick (Fort Wainwright)

- Seasonal activity split estimates by operating class were obtained and employed for each airport.

Each element of the airport inventory analysis methodology is presented in detail below. Where methods differed between airports, they are identified and described separately.

Model Used - The method currently required by the Federal Aviation Administration (FAA) for estimating aircraft emission inventories at airports employs the use of the FAA's Emissions and Dispersion Modeling System (EDMS). The latest version of the model available at the time of analysis was used (EDMS 4.5 released June 2006). EDMS has both the capability to model aircraft emissions and a limited capability to model other airport emission sources that are not aviation-specific, such as power plants, fuel storage tanks, and ground access vehicles. Since this analysis focused solely on CO emissions, EDMS was used to produce estimates for aircraft, ground support equipment, and auxiliary power units within the Fairbanks nonattainment area.

In order to perform aircraft emissions modeling, EDMS involves explicitly entering each combination of aircraft model and engine type to be considered in the modeling scenario, along with the activity level of each aircraft. Aircraft activity levels in EDMS are expressed in terms of landing and take-off cycles[*] (LTOs), which consist of the four aircraft operating modes: taxi and queue, take-off, climb-out, and landing. Default values for the amount of time a specific aircraft spends in each mode, or the time-in-modes (TIMs), are coded into EDMS, but may be updated with airport-specific values where available. In addition, the model also includes updateable default settings for the mixing height, ground support equipment emission factors and operating times, and aircraft engine assignments.

In modeling the aircraft CO inventory in Fairbanks, the aircraft activity levels by airframe model are needed for each facility as inputs into EDMS, and airport-specific estimates for the aircraft taxi and queue times are recommended.[†] However, results of discussions with personnel at each facility indicated that the aircraft model-specific activity data needed to support a complete analysis of emissions from all types of aircraft in Fairbanks are not currently available. Specifically, activity data are inadequate for military and general aviation aircraft where little detail is kept in the facilities' control tower records.

In order to address the data inadequacy mentioned above, an aggregate methodology was used for developing typical winter day aircraft CO emission inventories for Fairbanks airports and air bases, which includes the use of the EDMS model along with available fleet-average emission factors for some aircraft types.[‡] The same method was used to develop the aircraft inventories in Alaska's 2000 SIP, which was approved by EPA, and a similar aggregate method of analysis has been employed by EPA in the past to estimate

[*] Aircraft activity is also often expressed in terms of operations where an operation is defined as either a landing or a takeoff. Thus LTOs and operations are related by a factor of two; one LTO is represented by two operations (a landing and a corresponding takeoff).
[†] Of the four modes, the taxi and queue mode is the most variable depending on the airport configuration.
[‡] Aircraft types consist of air carrier, air taxi, military, and general aviation aircraft.

aircraft emission inventories from a number of airports, most recently in developing the 1996 National Toxics Inventory (NTI).[17*]

Aircraft Emissions – This subsection describes how aircraft activity data were combined with emission factors to calculate base year and forecasted aircraft emissions for each of the two airports (FAI and FBK). (Emissions from ground support equipment [GSE] and auxiliary power units [APU] are described in a separate subsection.) Since the methods differed by airport, they are discussed separately below.

Fairbanks International Airport (FAI) – Table 3-2 presents the number of annual aircraft operations at FAI by operating class and calendar year from 2005 though 2020 based on the airport Master Plan.

Table 3-2
FAI Master Plan-Based Annual Operations by Operating Class and Calendar Year

Calendar Year	Air Carrier (AC)	Air Taxi / Commuter AT)	Cargo	General Aviation (GA)	Military
2005	**12,454**	**19,140**	**10,500**	**98,992**	**2,500**
2006	12,818	19,418	10,579	100,675	2,500
2007	13,192	19,700	10,658	102,386	2,500
2008	13,577	19,986	10,738	104,127	2,500
2009	13,974	20,276	10,819	105,897	2,500
2010	**14,382**	**20,570**	**10,900**	**107,697**	**2,500**
2011	14,748	20,762	10,981	109,528	2,500
2012	15,123	20,955	11,063	111,390	2,500
2013	15,507	21,151	11,145	113,284	2,500
2014	15,901	21,348	11,229	115,209	2,500
2015	16,305	21,547	11,312	117,168	2,500
2016	16,720	21,748	11,396	119,160	2,500
2017	17,145	21,950	11,481	121,186	2,500
2018	17,581	22,155	11,567	123,246	2,500
2019	18,028	22,362	11,653	125,341	2,500
2020	**18,486**	**22,570**	**11,740**	**127,472**	**2,500**

Note: Results shown in boldface in Table 3-2 are forecasted estimates from the Master Plan. Values in the intervening years were interpolated assuming constant growth rates between those years where forecasted estimates were available from the Master Plan.

The Master Plan-based yearly operations estimates in Table 3-2 were then converted to wintertime LTOs for specific airframe models assumed to represent each operating class using seasonal activity factors and estimated mixes of each model provided by Alan Braley at FAI. These assumptions are listed in Table 3-3.

[*] The EPA 1996 analysis used the FAA Aircraft Engine Emission Database (FAEED), which preceded the EDMS model.

Table 3-3
Assumed Airframe Models and Usage Splits by Operating Class at FAI

Operating Class	Seasonal Activity Split		Airframe Model	Model Mix by Group
	Winter	Summer		
Air Carrier (AC)	41%	59%	B737-300	55%
			MD80	16%
			B757-200	29%
Air Taxi / Commuter (AT)	50%	50%	Navajo	75%
			BH-1900	20%
			Gulfstream I	5%
Cargo	50%	50%	*Assumed same mix of aircraft in the AT and AT groups, split 40%/60%, respectively*	NA
General Aviation (GA)	25%	75%	C172	100%
Military	50%	50%	*No specific model assumed, used average emission factor from FBK airport fleet*	NA

As indicated in Table3-3, cargo activity was distributed to the mix of air carrier (AC) and air taxi (AT) aircraft models assuming a 40% AC and 60% AT split. General aviation activity was modeled using the Cessna 172 as the single representative aircraft. Since no specific activity data were available that identified the types of military aircraft that occasionally used FAI, an average emission factor for those aircraft types identified at nearby Fort Wainwright (FBK) airport was assumed as noted in Table 3-3.

Table 3-4 presents the resulting wintertime LTOs by aircraft model by applying the assumptions in Table 3-2 to the annual operations by operating class listed in Table 3-2. The LTOs shown in Table 3-4 are average daily LTOs over the six-month winter season. (Recall that two operations represent one LTO.) For example, the B737-300 LTOs in 2005 were calculated by applying the model mix for that aircraft (55%) to total 2005 AC operations shown in Table 3-2 for 2005 (12,454), the 40% split of 2005 cargo operations (10,500) to ACs and the winter season splits for AC and Cargo of 41% and 50%, respectively.

Table 3-4 FAI Estimated Wintertime LTOs per Day by Aircraft and Calendar Year								
Calendar Year	B737-300	MD80	B757-200	Navajo	BH-1900	Gulfstream	C172	Military
2005	10.90	3.17	5.75	26.14	6.97	1.74	67.80	3.42
2006	11.15	3.24	5.88	26.47	7.06	1.76	68.96	3.42
2007	11.40	3.32	6.01	26.81	7.15	1.79	70.13	3.42
2008	11.67	3.39	6.15	27.15	7.24	1.81	71.32	3.42
2009	11.94	3.47	6.29	27.50	7.33	1.83	72.53	3.42
2010	12.22	3.55	6.44	27.85	7.43	1.86	73.77	3.42
2011	12.47	3.63	6.57	28.10	7.49	1.87	75.02	3.42
2012	12.72	3.70	6.71	28.35	7.56	1.89	76.29	3.42
2013	12.99	3.78	6.85	28.60	7.63	1.91	77.59	3.42
2014	13.26	3.86	6.99	28.85	7.69	1.92	78.91	3.42
2015	13.53	3.94	7.14	29.11	7.76	1.94	80.25	3.42

Mathematically, this is given as follows:

$$[(12{,}454 \times 41\%) + (10{,}500 \times 40\% \times 50\%)] \times (55\%/2) / (365/2) = 10.90$$

The method used to develop CO emission factors (in lb per LTO) at FAI is summarized below. The commercial aircraft and general aviation CO emissions (which make up almost the entire FAI CO inventory) were estimated using the EDMS model (Version 4.5). For the modeling, a winter average mixing height of 1,000 feet was used, which is the minimum allowed by EDMS and is closest to the winter average mixing height found for the city of Fairbanks from 1984 to 1991 (852 feet).[18] EDMS default time-in-mode (TIM) values were not used for FAI for taxi and queuing mode. Instead, average taxi and idle/queuing times for FAI were based on data obtained from the Bureau of Transportation Statistics (BTS) Airline On-Time Statistics database.[19]

Due to the lack of airframe model data for military aircraft at FAI as noted earlier, emission factors for military aircraft were estimated differently. An estimate was made of the typical military airframe model distribution for military aircraft flying in and out of FAI. According to FAI personnel, the airframe distribution was similar to that of the military aircraft distribution at FBK.[20] Therefore, the fleet-average CO emission factor from military flights at FBK was used to estimate the CO inventory of the military flights at FAI (see the following FBK methodology).

Table 3-5 summarizes the resulting CO emission factors used for each aircraft type modeled at FAI.

Table 3-5 **FAI Aircraft CO Emission Factors (lb/LTO) by Aircraft Model**							
B737-300	MD80	B757-200	Navajo	BH-1900	Gulfstream	C172	Military
12.96	13.73	24.18	48.52	12.68	34.59	9.77	4.80

Fort Wainwright Air Force Base (FBK) – Base personnel[21] at FBK provided estimates of the number of average daily LTOs during wintertime for individual aircraft models. The FBK aircraft activity estimates were provided for two types of activity: (1) "fixed" activity from aircraft assigned to FBK; and (2) transient activity for other aircraft using, but not assigned to, FBK. These estimates were provided for three separate wintertime periods: 2005/06, 2006/07, and 2007/08 and later (subsequently referred to as 2005, 2006, and 2007+, respectively) to account for deployment of the OH58D (Kiowa Warrior) helicopter over this period. No changes to the aircraft mix were assumed beyond 2007. Table 3-6 presents these average daily winter LTO estimates for FBK by activity type, operating class, aircraft model, and calendar year.

Table 3-6
FBK Estimated Wintertime LTOs per Day by Activity Type, Operating Class, Aircraft Model, and Calendar Year

Activity Type	Operating Class	Aircraft Model	Calendar Year 2005	2006	2007+
Assigned (Fixed)	Military	H60	30	30	30
		H47	12	12	12
		OH58D	0	10	30
Transient	Military	C560	0.065	1.613	1.645
		SH33	0.081	0.161	0.161
		C12	0.645	0.645	0.645
		KC135	0.161	0.161	0.161
		C5	0.027	0.027	0.027
		C130	0.081	0.081	0.081
		F16	0.323	0.323	0.323
		A10	0.323	0.323	0.323
		C17	0.013	0.027	0.027
	General Aviation	C172	0.097	0.097	0.097
		C150	0.032	0.032	0.032
		DC6	0.065	0.065	0.065
		C46	0.065	0.065	0.065
		PA31	0.065	0.065	0.065
		PA12	0.194	0.194	0.194
		PA18	0.161	0.161	0.161
		C182	0.065	0.065	0.065
		B06	0.129	0.129	0.129
		B105	0.032	0.032	0.032
		B212	0.065	0.065	0.065
		LJ35	0.032	0.032	0.032
		LJ45	0.032	0.032	0.032

Not all of the airframe models listed in Table 3-6 are represented in the EDMS model. The H60 was assumed to represent activity for all other military helicopter types (H47 and OH58D). Similarly, and as assumed for general aviation activity at FAI, the C172 was assumed to be representative of all GA aircraft types at FBK.

Similarly to the FAI analysis, a mixing height of 1,000 feet was assumed (instead of the EDMS default value of 3,000 feet). Default time-in-mode (TIM) values from EDMS were assumed since no air-base-specific times were available.

With these assumptions, EDMS 4.5 was executed to produce LTO-based CO emission factors for each modeled aircraft type. The resulting CO emission factors for each aircraft are shown in Table 3-7.

Table 3-7
FBK Aircraft CO Emission Factors (lb/LTO) by Aircraft Model and Calendar Year

Operating Class	Aircraft Model	Aircraft CO Emission Factor (lb / LTO)
Military	H60	3.9
	C560	25.55
	SH33	9.79
	C12	15.74
	KC135	52.4
	C5	134.75
	C130	47.75
	F16	17
	A10	34.94
	C17	47.51
General Aviation	C172	9.77

Ground Support Equipment (GSE) Emissions – Methods used to compute CO emissions from GSE and APUs operated at each airport in conjunction with aircraft operations are discussed in this subsection.

Fairbanks International Airport (FAI) - According to FAI personnel, the majority of the ground support equipment used for commercial flights at FAI was gasoline powered with the exception of their aircraft tugs and loaders, which are Diesel powered.[22] Using this information, the baseline 2005 estimates for the GSE CO inventory at FAI were generated using the EDMS 4.5 model in a manner that estimated "composite" GSE/APU emission factors per LTO as a function of aircraft model. Version 4.5 of EDMS contains updated GSE emission factors based on EPA's NONROAD model which are lower than those in the earlier version (4.11) used in the 2004 Maintenance Plan.

As with the FAI aircraft emission factors, the LTO-based GSE emission factors from EDMS assume the same mix of GSE for baseline and future years. Consequently, any future fleet changes such as electrification of GSE, use of alternative fuels, and fleet turnover to cleaner engines would result in lower future GSE/APU emissions than estimated.

Table 3-8 lists the EDMS-based GSE/APU CO emission factors used for FAI.

Table 3-8
FAI GSE/APU CO Emission Factors (lb/LTO) by Aircraft Model

B737-300	MD80	B757-200	Navajo	BH-1900	Gulfstream	C172	Military
12.96	13.73	24.18	48.52	12.68	34.59	9.77	1.23

Fort Wainwright Air Force Base (FBK) - As with FAI, EDMS 4.5 was used to estimate the GSE/APU CO inventory for FBK. However, because no information was available on the fuel-type distribution for the GSE/APU used in the air base, the default GSE/APU assignment for each aircraft in EDMS was used. Table 3-9 lists the EDMS-based GSE/APU CO emission factors used for FBK.

Table 3-9
FBK GSE/APU CO Emission Factors (lb/LTO) by Aircraft Model and Calendar Year

Operating Class	Aircraft Model	GSE/APU CO Emission Factor (lb / LTO)
Military	H60	1.12
	C560	28.35
	SH33	40.85
	C12	1.12
	KC135	1.12
	C5	1.12
	C130	1.12
	F16	1.12
	A10	1.12
	C17	1.12
General Aviation	C172	0.02

Due to the lack of forecasted changes in fleet mix over time, the GSE/APU emission factors for 2006 through 2015 were conservatively assumed to be equivalent to 2005 activity levels for the purpose of estimating the typical winter day CO inventory in FBK.

Airport Winter CO Inventory - The resulting winter day CO emissions found for FAI and FBK for calendar years 2005 to 2015 are summarized in Table 3-10. The CO emissions shown in Table 3-10 were computed by multiplying aircraft-specific LTOs by their appropriate aircraft and GSE/APU emission factors presented earlier in this subsection. The results in Table 3-10 are summarized across all aircraft types.

Table 3-10
Airport CO Wintertime Emissions (tons per day) by Calendar Year

Year	Fairbanks Int'l (FAI)		Ft. Wainwright (FBK)		All Airport Totals	
	Aircraft	GSE/APU	Aircraft	GSE/APU	Aircraft	GSE/APU
2005	1.210	1.021	0.110	0.027	1.320	1.048
2006	1.228	1.042	0.150	0.056	1.378	1.098
2007	1.247	1.063	0.189	0.068	1.436	1.131
2008	1.266	1.085	0.189	0.068	1.455	1.153
2009	1.285	1.108	0.189	0.068	1.474	1.176
2010	1.305	1.131	0.189	0.068	1.494	1.199
2011	1.321	1.151	0.189	0.068	1.511	1.219
2012	1.338	1.171	0.189	0.068	1.528	1.239
2013	1.355	1.192	0.189	0.068	1.545	1.260
2014	1.373	1.214	0.189	0.068	1.562	1.282
2015	1.390	1.236	0.189	0.068	1.580	1.304

Non-Road Emissions Summary

Using the methods and assumptions outlined above, emissions estimates were prepared for non-road vehicles, locomotives, and aircraft. A summary of these estimates is presented in Table 3-8, which shows that non-road emissions are predicted to increase by roughly 20% over the 2005 to 2015 period. With the exception of aircraft operations and related ground support equipment activity, emissions from most sources are forecast to remain stable.

Table 3-8
Fairbanks Urban Nonattainment Area CO Emissions Inventory
Non-Road Equipment

	CO (tpd)										
Nonroad Sources	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Agricultural Equipment	-	-	-	-	-	-	-	-	-	-	-
Aircraft	1.32	1.38	1.44	1.46	1.47	1.49	1.51	1.53	1.54	1.56	1.58
Airport Ground Support Equipment	1.05	1.10	1.13	1.15	1.18	1.20	1.22	1.24	1.26	1.28	1.30
Commercial Equipment	-	-	-	-	-	-	-	-	-	-	-
Construction and Mining Equipment	-	-	-	-	-	-	-	-	-	-	-
Industrial Equipment	-	-	-	-	-	-	-	-	-	-	-
Lawn and Garden Equipment	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Logging Equipment	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09
Pleasure Craft	-	-	-	-	-	-	-	-	-	-	-
Railroad Operations (Locomotives)	0.44	0.45	0.45	0.45	0.46	0.46	0.46	0.47	0.47	0.48	0.48
Railroad Equipment*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recreational Equipment	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15
Underground Mining Equipment	-	-	-	-	-	-	-	-	-	-	-
TOTAL	3.04	3.16	3.26	3.30	3.35	3.40	3.44	3.49	3.53	3.58	3.62

* Does not include emissions from locomotive engines.

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4. AREA SOURCE EMISSIONS

Area Sources

Area sources are small sources that individually emit a small quantity of emissions, but collectively can have a significant impact on regional air quality. The quantifiable area sources present in the Fairbanks area, which are limited to combustion sources generally used for heating and cooking, include residential wood burning, fuel oil, propane, coal, natural gas combustion, and structural fires.

Emissions from these sources are primarily based on activity estimates obtained from local Fairbanks agencies and/or fuel distributors. An extensive data collection effort was performed to obtain fuel use data on a calendar-year-specific basis. In cases where information was not available for later calendar years, future year predictions were often calculated by applying the FNSB annual population increases shown in Table 3-1 to the fuel use totals for previous years.

The following is a description of the methodology used to calculate emissions from each area source.

Residential Woodburning – These emissions are primarily based on the estimated number of cords of wood burned in Fairbanks combined with EPA's AP-42 emission factors (in units of pounds of CO generated per cord of wood burned), as discussed in detail later in this section. The 2005 wood use total was determined using the results of the 2005-06 Fairbanks Home Heating Survey[*] conducted by Hays Research Group which polled roughly 300 residences in Fairbanks about home heating sources and activity. The survey included questions about the type of wood-burning home heating devices used (e.g., fireplaces, inserts, or woodstoves), and the amount of wood burned (in cords or pellet stove bags) during both winter (Oct-May) and summer (Jun-Sep) seasons. The polled residences were population weighted across each of the ZIP codes located within the Fairbanks CO Nonattainment Area; survey results are included in Tables 4-1 and 4-2, which detail the calculations for total woodburning emissions.

The results of this survey showed that the amount of wood burned during the winter of 2005 was 3.335 times more than the earlier estimate (e.g., 9,128 vs. 2,737 cords). Note that the earlier estimate was based largely on permits issued by the U.S. Department of Forestry. For years 2006-2015, wood-burning emissions were assumed to change as a

[*] The 2005-2006 Fairbanks Home Heating Survey was conducted via telephone by the Hays Research Group, PO Box 110183, Anchorage, Alaska 99511-0183.

Table 4-1 Winter Residential Woodburning Estimates in CY 2005							
Appliance Type	% Homes Equipped[a]	Cords Burned[b]	Cords Burned/ Day[c]	AP-42 EF (lb/ton)	Adjusted EF (lbs/cord)	CO (lb/day)	CO (tpd)
Fireplace w/ Insert	8.37%	764	4	140.8[d]	220.1	793	0.40
Fireplace w/out Insert	13.31%	1,215	6	128.1[e]	200.3	1,148	0.57
Conventional Woodstove	25.13%	2,294	11	230.8	360.9	3,905	1.95
Catalytic Woodstove	21.34%	1,948	9	104.4	163.2	1,500	0.75
Low-Emitting Non-Catalytic	26.94%	2,459	12	140.8	220.1	2,553	1.28
Other	4.91%	448	2	140.8	220.1	465	0.23
FNSB Total	100%	9,128	43			10,364	5.18
2005 Urban Nonattainment Area Total	(FNSB Total * 47% Nonattainment Area Fraction)						2.44

[a] Woodstove technology distribution based on the 2005-06 Fairbanks Home Heating Survey.
[b] Assumes all wood burned annually is consumed during the October 1 – April 30 period (212 days).
[c] AP-42 emission factors (in lbs CO/ton of wood burned) were converted to lb/cord factors by multiplying them by the cord volume (80 ft^3/cord) and wood density (36 lb/ft^3 as shown in Table 27).
[d] AP-42 only provides emission factors for fireplaces without inserts. Non-catalytic woodstove emission factors from AP-42 were used to represent fireplaces with inserts.
[e] Reflects updated emission factors for wood-burning fireplaces presented by EPA at an Emissions Inventory conference in May 2001.

Table 4-2 Winter Residential Pellet Stove Emission Estimates in CY 2005					
% Survey Households Equipped	Projected FNSB Households Equipped	# 40 lb Stove Pellet bags burned/season/ household	Total Tons Burned	CO EF (#/ton burned)	Total CO (tons/day)
5.1%	1,736	54	1,875	52.2	0.27
100%	34,046				
(FNSB Pellet Stove Total * 47% Nonattainment Area Fraction)					0.13
Nonattainment Area Total (Woodburning + Pellet Stove)					2.57

function of population, and were calculated by adjusting the 2005 CO estimate by the annual population increases shown in Table 3-1.

2005 Woodburning Emissions – These emissions are based primarily on the estimated number of cords of wood burned in Fairbanks combined with EPA's AP-42 emission factors (in units of pounds of CO generated per cord of wood burned), as discussed below. The general calculation method for residential wood combustion emissions used in this analysis is as follows:

(Cords of wood burned/day) x [EF (lbs CO/cord burned)] x (% homes w/ wood stoves)

FNSB staff provided wood use by type for calendar year 2002, which it is assumed approximates the distribution of wood types cut by permit in 2005 as well. This distribution is shown in Table 4-3, and was used to determine an average density for the wood burned in the FNSB area. This average wood density allowed for conversion of AP-42 emission factors from pounds of CO per ton of wood burned to pounds of CO per cord of wood burned.

Table 4-3
Distribution of Wood Types Cut for Commercial And Personal Use Permits in Fairbanks

Wood Type	Wood Density (lb/ft^3)	2005 Cords Cut
Spruce	27	531
Birch	42	2,205
Aspen	25	
TOTAL		2,737
Weighted Wood Density (lb/ft^3)		39

As noted previously, EPA's AP-42 contains emission factors for several specific types of woodburning appliances. These emission factors, and the appliance distribution from the 2005-06 Fairbanks Home Heating Survey discussed above are shown above in Table 4-1, as are detailed emission calculations for calendar year 2005. Table 4-2 shows the pellet stove emission calculations, along with the associated emission calculations for calendar year 2005. An example of the emission factor conversion methodology (i.e., to convert AP-42 emission factors in pounds of CO per ton of wood burned to pounds of CO per cord of wood burned) used to produce the emission factors shown in Tables 4-1 and 4-2 is shown below.

$$[104.4 \text{ (lbs CO/ton of wood)}] \times (39 \text{ lbs/ft}^3) \times (80 \text{ ft}^3\text{/cord}) \times (\text{ton of wood/2000 lbs}) = 163.2 \text{ lbs CO/cord}$$

Fuel Oil and Propane – In calculating emissions from Fuel Oil and Propane Combustion, AP-42 emission factors were again applied to a fuel use total provided by FNSB staff.

The staff obtained annual home heating fuel delivery information from local fuel oil distributors and propane distributors for the months of January, February, November, and December for calendar years 1995-2003. In the absence of any reliable fuel oil use predictions beyond the 2002-2003 season, the total for that year was assumed to be equal to the total for 2005. This is a reasonable assumption, given the lack of population growth in the urban nonattainment area, as well as the replacement of fuel oil use with natural gas over the past few years, as discussed below. The 2005 emissions for both fuel oil and propane were calculated by applying EPA AP-42 emission factors for those fuels to the fuel use totals, as shown below in Tables 4-4 and 4-5. In both cases, the FNSB totals were adjusted by the nonattainment area population fraction to give the emission totals for the nonattainment area only, as shown.

Table 4-4
Fuel Oil Use and Calculated CO Emissions Used for 2005 Inventory

Calendar Year	Fuel Use (10^3 gal/season)	Fuel Use (10^3 gal/day)	AP-42 Emission Factor (lbs/10^3gal)	CO Emissions (lbs/day)	CO Emissions (tons/day)
2005	15,449	128.7	5	643.7	0.32
2005 Nonattainment Area Total	(FNSB Total * 47% Urban Split)				0.15

Table 4-5
Propane Use and Calculated CO Emissions Used for 2005 Inventory

Calendar Year	Fuel Use (10^3 gal/season)	Fuel Use (10^3 gal/day)	AP-42 Emission Factor (lbs/10^3gal)	CO Emissions (lbs/day)	CO Emissions (tons/day)
2005	615	5.17	1.9	9.80	0.0049
2005 Nonattainment Area Total	(FNSB Total * 47% Urban Split)				0.002

In the case of propane, FNSB staff performed a brief telephone survey to determine the most common uses of this fuel. The staff determined that most propane in Fairbanks is used for restaurant cook stoves and residential water heating, not for home heating. However, AP-42 does not contain propane emission factors specific to these uses, so a more generic “commercial boiler” emission factor of 1.9 pounds of CO per 1,000 gallons of fuel burned was used, as shown in Table 4-5. In the absence of any reliable propane use predictions for future years, the 2001 total was assumed to be equal to the calendar year 2005 total. This is a reasonable assumption, given the lack of population growth in the FNSB urban area, as discussed earlier in this report, and an assumed commensurate lack of growth in the number of restaurant cook stoves and water heaters, which most commonly use propane as a fuel source, is also reasonable.

Coal – According to FNSB staff, the sole local coal distributor in the Borough went out of business in 1998. Nevertheless, in this analysis we have conservatively assumed that the calculated emissions from coal combustion in 1998 are constant through 2005, to account for any distributor from outside the Borough who may still be supplying coal to Fairbanks residents or businesses. The weekly coal use total, shown in Table 4-6, was multiplied by the current AP-42 emission factor listed for bituminous and sub-bituminous coal stokers, which is 5 pounds of CO per ton of coal burned. The calculations and final results are also included in Table 4-6.

Table 4-6
Coal Use and Calculated Emissions Used for 2005 Inventory

Calendar Year	Coal Use (tons/week)	Coal Use (tons/day)	AP-42 Emission Factor (lbs/ton)	CO Emissions (lbs/day)	CO Emissions (tons/day)
2005	20	2.86	5	14.3	0.007
2005 Urban Nonattainment Area Total	(FNSB Total * 47% Urban Split)				0.003

Natural Gas – Since 1998, natural gas supplies have been trucked in from Anchorage and distributed via an expanding natural gas pipeline supply system. Currently, the pipeline extends just beyond the nonattainment area of Fairbanks. However, in developing this inventory, we have conservatively assumed that all emissions associated with natural gas usage in the Borough are attributed to the urban nonattainment area, as shown in Table 4-7.

FNSB staff obtained a detailed listing of gas use for calendar years 1999 and 2000 for the winter season (January-April and October-December), as well as both the winter season and calendar year totals for 2001. In the absence of any more recent data, we have assumed that natural gas usage doubled annually from 2002 through 2004, and leveled off thereafter. This is a reasonable assumption, because although natural gas use could increase somewhat during the 2005 and later period, such an occurrence would likely lead to a corresponding decrease in fuel oil use (i.e., natural gas use is expected to replace fuel oil use rather than result from increased growth in the nonattainment area), which

Table 4-7 Natural Gas Use and Calculated Emissions Used for 2005 Inventory					
Calendar Year	Natural Gas Use (100 ft^3/season)	Natural Gas Use (ft^3/day)[a]	AP-42 Emission Factor (lbs/mm ft^3)	CO Emissions (lbs/day)	CO Emissions (tons/day)
2005	9,546,205	4,502,927	40	180.1	0.090

[a] The winter season is 212 days per year.

would effectively negate any net emissions increase in the region. Therefore, the assumed 2005 fuel use estimate is included in Table 4-7, along with the applicable AP-42 emission factor (40 pounds of CO per million cubic feet of fuel burned), and calculated CO emission total.

Structural Fires and Open Burning – According to FNSB staff, solid waste incineration in the winter is limited to hospital incinerators, animal control, and small incinerators at a few shop operations, all of which are assumed to be negligible. Furthermore, the staff believes that the amount of activity has not changed significantly from the totals documented in the 1990 CO Inventory referenced earlier in this report. Since wintertime open burning is prohibited throughout the Borough, structural fires are essentially the only source of emissions in this category.

The number of structural fires in 2005 is assumed to be the same as that used in the 1990 CO Inventory—one per inventoried day. Combining this with an emission factor developed by the California Air Resources Board (327.6 lbs/fire)[23] gives total 2005 emissions from this source of 0.16 tons per day, as shown in the detailed calculation below.

(1 structural fire/day) x (327.6 lbs CO/fire) x (1 ton/2000 pounds) = 0.16 tons/day

This Borough-wide total was then adjusted by the nonattainment area population fraction (i.e., 0.47%) to give the emission total for the nonattainment area only, as shown in the area source summary in Table 4-8.

Table 4-8
Fairbanks Urban Nonattainment CO Emissions Inventory
Area Sources

	CO (tpd)										
Area Sources	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Residential Wood Burning	2.57	2.65	2.67	2.69	2.72	2.74	2.76	2.79	2.81	2.84	2.86
Fuel Oil	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.17	0.17
Propane	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Coal	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Natural Gas	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Structural Fires	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09
TOTAL	**2.89**	**2.98**	**3.01**	**3.03**	**3.06**	**3.09**	**3.11**	**3.14**	**3.17**	**3.20**	**3.23**

Area Source Emissions Summary

Table 4-8 shows the area source emissions calculated for the FNSB urban nonattainment area for calendar years 2005 through 2015. As noted above, the 2005 emissions for each area source category detailed above were assumed to have increased proportionally to the population increase shown in Table 3-1, through the 2015 calendar year. The resulting calendar year totals for 2005 through 2015 shown below in Table 4-8 illustrate that residential woodburning is responsible for the majority of the area source inventory.

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5. POINT SOURCE EMISSIONS

The CAAA section 172 (c) requirements for nonattainment areas do not apply to maintenance areas. The requirements for reasonable further progress, identification of certain emissions increases, and other measures needed for attainment do not apply because these measures have meaning only for areas not attaining the standard. Under this maintenance plan, the requirements of CAAA Part D, New Source Review (NSR) no longer apply as they did under nonattainment. Upon redesignation to maintenance, the prevention of significant deterioration (PSD) program replaces the NSR program requirements for major stationary sources. Section 302 of the CAAA (42 U.S. C. 7602) defines a major stationary source as any stationary facility or source of air pollutants that directly emits, or has the potential to emit, 100 tons per year of any pollutant. Permits for construction and operation of new or modified major stationary sources within the maintenance area must be approved through the PSD program. Within the FNSB, ADEC is responsible for issuing construction and Title V operating permits. ADEC has incorporated the requirements for PSD in 18 AAC 50, Article 3.

Maintenance Demonstration Calculations – The methodology used to quantify base year emissions for each point source operating in Fairbanks is essentially the same as the one employed in estimating point source emissions for the previous Maintenance Plan. That effort computed emissions for 2001 and used population growth rates to adjust the estimates to the 2002 base year. Given that stationary source emissions increase largely in proportion to population growth and that no future improvements in CO emission control technology are assumed, this is a reasonable approach both to establish base year emissions and to forecast emissions for future years.

In this effort, ADEC staff calculated point source emissions for 2002 under the supervision of the state inventory coordinator. The calculations were based on quarterly or monthly production and process information provided by the source in required facility operating reports in calendar year 2002. The emission factors were from the most current version of AP-42. ADEC calculated daily point source emissions for a typical wintertime day during the peak CO season by dividing the quarterly or monthly activity levels by the number of operating days per reporting period. Source emission estimates were based on actual fuel consumption and operations rather than permit-allowable emissions. The 2002 estimates were increased by the ratio of Fairbanks' population in 2005 to that in 2002 to produce a 2005 base year emission estimate for each source. Projections for future years were based on population projections supporting the recent Long Range Transportation Plan (LRTP).

FNSB Urban Nonattainment Area Point Sources

Based on ADEC-issued air quality permits, there are nine point sources in the Borough, seven of which contribute emissions to the urban nonattainment area. Estimated emissions from each source for 2005 through 2015 are listed in Table 5-1 at the end of this section. Three of the sources of concern are primarily coal-fired electrical generating facilities: Fort Wainwright, Aurora Energy, and University of Alaska Fairbanks. Two other point sources are oil-fired electrical generating facilities: Golden Valley Electrical Association (GVEA) North Pole and GVEA Zehnder. The two remaining sources are the Williams Petroleum and PetroStar refineries located in North Pole. The FNSB area point sources that do not contribute to emissions in the urban nonattainment area are Alyeska Pipeline Service Company's Pump Station #8, and the Eielson Air Force Base power plant.

Source Descriptions and Emission Estimation Information – ADEC used facility-specific information found in facility permits and operating reports along with AP-42 emission factors to estimate emissions for each of the nine point sources. This section provides a summary of the equipment, emission factors, and operations used to estimate actual emissions at each facility**.**

1. Golden Valley Electrical Association, Inc. – North Pole Power Plant: The GVEA North Pole electrical generating facility consists of two stationary gas turbines that operate on fuel oil combustion. The emission factor used in the CO emission calculations for this facility was 3.3 E-03 lb/MMBtu, found in Table 3.1-1 of AP-42. Emissions were based on the January monthly fuel combustion.

2. Golden Valley Electrical Association, Inc. - Zehnder Power Plant: The GVEA Zehnder electrical generating facility consists of two stationary gas turbines and two Diesel generators that operate on fuel oil combustion. The emission factor used in the CO emission calculations for the stationary gas turbines at this facility was 3.3 E-03 lb/MMBtu, found in Table 3.1-1 of AP-42. The emission factor used in the CO emission calculations for the Diesel generators at this facility was 0.85 lb/MMBtu, found in Table 3.4-1 of AP-42. Emissions were based on the January monthly fuel combustion.

3. Fort Wainwright Power Plant: The facility at Fort Wainwright consists of eight coal-fired boilers and five Diesel generators. For the boilers, the CO emission factor used in the calculation was 6 lbs CO/ton, which is for overfeed stoker with chain grates. This factor can be found in Table 1.1-3 of AP-42. The Diesel generators were not operated during the period for which emissions were being calculated. Fort Wainwright reports operations and fuel consumption on a quarterly basis. The first quarter's consumption was divided by the number of days in the quarter to obtain daily fuel consumption from coal.

4. PetroStar North Pole Refinery: The PetroStar North Pole Refinery is a topping plant. The emission factor used to calculate CO emissions from the topping plant was dependent on the type of fuel consumed. For process gas, the emission factor

was 84 lb/MMscf, obtained from AP-42, Table 1.4-1. For fuel oil, the emission factor used was 0.21 lb/bbl, taken from AP-42, Table 1.3-1.

5. University of Alaska Fairbanks Power Plant: The University of Alaska power generating facility consists of two coal-fired boilers, two oil-fired boilers, and a Diesel engine. The AP-42 emission factor used for the coal-fired boilers was 5 lbs/ton, obtained from Table 1.1-3. The emission factor used for the oil-fired boilers was 5 lbs/gallon, obtained from AP-42, Table 1.3-1. There was no operation of the Diesel engine during the time period in question. Due to the availability of operating reports, fourth quarter reports were used to generate the emissions for a typical winter day. The total CO per day was divided by the number of operational days for each piece of equipment for that quarter. If the operating report did not specify the number of operational days for a piece of equipment, it was assumed that the operation occurred over the entire quarter.

6. Williams (MAPCO) Alaska Petroleum North Pole Refinery: The equipment at the Williams North Pole Refinery consists of various heaters, generators, and a flare. The emission factors used were as follows:

   - For fuel gas, light straight run (LSR), and naptha use in Heater numbers 241, 1001, 2001, 3700, and 8001, the emission factor was 3.6 lb/1000 gal found in AP-42 Table 1.5-1.

   - For LSR and No.2 fuel use in Heater numbers 240, 5005, 5006, 401, 402, 8002, 5010, and the asphalt heater, the emission factor was 5 lb/1000 gal found in AP-42 Table 1.3-1.

   - For the LPG use in the flare, the emission factor was 0.37 lb/MMBtu found in AP-42 Table 13.5-1.

   Emissions at the Williams facility were based on the January monthly fuel combustion.

7. Aurora Energy Power Plant (formerly FMUS): The Aurora Energy power plant has four boilers operating on coal. There are also five steam-driven turbines at the facility. The emissions from the coal-fired boilers were calculated using the AP-42 emission factor for overfeed stoker with chain grates. That emission factor, found in Table 1.1-3, is 6 lbs CO/ton of coal. The total tons of coal consumed by the four boilers during January provided the basis for the emission estimates. This was converted to a daily value to give emissions on a daily basis.

Summary of Point Source Emissions

The emissions for a typical winter day (in tons per day) at each point source are provided in Table 5-1. As noted above, emissions are projected from calculated CY 2002 emissions using actual population values for 2002 and 2005 and the population growth rate used in the recent LRTP.

Table 5-1
Fairbanks Urban Nonattainment CO Emissions Inventory
Point Sources

Point Source	CO Emissions (tpd)					
	2005	2006	2007	2008	2009	2010
MAPCO(Williams/Flint Hills)	0.08	0.08	0.08	0.08	0.08	0.08
Eielson	0.00	0.00	0.00	0.00	0.00	0.00
Fort Wainwright	1.45	1.50	1.51	1.52	1.54	1.55
GVEA/ North Pole	0.03	0.03	0.03	0.03	0.03	0.03
Alaska RR Heating Plant	0.01	0.01	0.01	0.01	0.01	0.01
University of Alaska-Fairbanks	0.50	0.51	0.52	0.52	0.53	0.53
Petro-Star	0.003	0.003	0.003	0.003	0.003	0.003
Fairbanks MUS (Aurora)	1.02	1.05	1.06	1.07	1.08	1.09
Alyeska Pump Station #8	0.00	0.00	0.00	0.00	0.00	0.00
Total	3.08	3.18	3.21	3.23	3.26	3.29
Point Source	CO Emissions (tpd)					
	2011	2012	2013	2014	2015	
MAPCO(Williams/Flint Hills)	0.08	0.08	0.08	0.08	0.08	
Eielson	0.00	0.00	0.00	0.00	0.00	
Fort Wainwright	1.56	1.58	1.59	1.61	1.62	
GVEA/ North Pole	0.03	0.03	0.03	0.03	0.03	
Alaska RR Heating Plant	0.01	0.01	0.01	0.01	0.01	
University of Alaska-Fairbanks	0.54	0.54	0.55	0.55	0.56	
Petro-Star	0.003	0.003	0.003	0.003	0.003	
Fairbanks MUS (Aurora)	1.10	1.11	1.12	1.13	1.14	
Alyeska Pump Station #8	0.00	0.00	0.00	0.00	0.00	
Total	3.32	3.35	3.38	3.41	3.44	

###

6. EMISSIONS SUMMARY

Based on the information presented in the previous chapters, total emissions for a typical wintertime weekday were estimated for each year from 2005–2015. The results for each of the primary source categories are presented in Table 6-1, and the percentage contribution from each of the four source categories is shown in Table 6-2. The data in these two tables show several interesting trends. First, we see that although on-road mobile sources contributed the bulk of the CO emitted for each of the years considered, their proportional contribution is decreasing by 9% over time—from 74% to 65% in the Fairbanks urban area. This is despite the conservative assumptions employed in the on-road mobile source calculations.

Second, and conversely, the contribution of nonroad emissions to the overall CO inventory is predicted to increase by 19% between 2005 and 2015. Table 6-1 shows that although most of the nonroad equipment categories are relatively stable through 2015, there is an overall increase from nonroad equipment of over one half ton per day. This increase comes mainly from increased activity from aircraft and its associated ground support equipment and, to a much lesser extent, from modest increases in snowmobile emissions caused by fleet expansion. The relatively stable emissions shown from most nonroad sources suggest that the increasingly restrictive emission standards scheduled to take effect in the next few years for many types of nonroad equipment will keep pace with increases resulting from the predicted expansion in the equipment population.

Third, the point source contribution to the FNSB inventory is also shown to increase by 12% from 2005 to 2015. However, as discussed earlier in the report, this increase is directly proportional to the population increase used to develop the recent LRTP, rather than any real indication of an increase in emissions from these sources. Lastly, the contribution from area sources is predicted to increase at the same rate, as it is tied to the same population forecasts used to project point source emissions.

When the changes for all of the source categories are combined, the level of CO emitted across the entire Borough was reduced by 14% between 2005 and 2015—from 34.3 tons per day to 29.5 tons per day. This, as discussed above, is attributed mainly to the 24% decrease in mobile source emissions, which was offset slightly by modest increases in the other categories. Overall, considering that the population in the FNSB urban area has until recently been declining very slightly over the past decade, these results reflect the successful introduction of low-emission technology into both the vehicle and nonroad fleet, as well as the growing importance of Fairbanks as a key stopover point in military and commercial air routes to northern Europe.

Table 6-1
Fairbanks 2005–2015 Carbon Monoxide Emissions Inventory
(tpd)

Nonroad Sources	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Agricultural Equipment	-	-	-	-	-	-	-	-	-	-	-
Aircraft	1.32	1.38	1.44	1.46	1.47	1.49	1.51	1.53	1.54	1.56	1.58
Airport Ground Support Equipment	1.05	1.10	1.13	1.15	1.18	1.20	1.22	1.24	1.26	1.28	1.30
Commercial Equipment	-	-	-	-	-	-	-	-	-	-	-
Construction and Mining Equipment	-	-	-	-	-	-	-	-	-	-	-
Industrial Equipment	-	-	-	-	-	-	-	-	-	-	-
Lawn and Garden Equipment	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Logging Equipment	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09
Pleasure Craft	-	-	-	-	-	-	-	-	-	-	-
Railroad Operations (Locomotives)	0.44	0.45	0.45	0.45	0.46	0.46	0.46	0.47	0.47	0.48	0.48
Railroad Equipment*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Recreational Equipment	0.14	0.14	0.14	0.14	0.14	0.15	0.15	0.15	0.15	0.15	0.15
Underground Mining Equipment	-	-	-	-	-	-	-	-	-	-	-
TOTAL Nonroad Sources	**3.04**	**3.16**	**3.26**	**3.30**	**3.35**	**3.40**	**3.44**	**3.49**	**3.53**	**3.58**	**3.62**
Area Sources											
Residential Wood Burning	2.57	2.65	2.67	2.69	2.72	2.74	2.76	2.79	2.81	2.84	2.86
Fuel Oil	0.15	0.15	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.17	0.17
Propane	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Coal	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Natural Gas	0.09	0.09	0.09	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Structural Fires	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09
TOTAL Area Sources	**2.89**	**2.98**	**3.01**	**3.03**	**3.06**	**3.09**	**3.11**	**3.14**	**3.17**	**3.20**	**3.23**
Point Sources											
MAPCO (Williams/Flint Hills)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Eielson	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fort Wainwright	1.45	1.50	1.51	1.52	1.54	1.55	1.56	1.58	1.59	1.61	1.62
GVEA/North Pole	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Alaska RR Heating Plant	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
University of Alaska-Fairbanks	0.50	0.51	0.52	0.52	0.53	0.53	0.54	0.54	0.55	0.55	0.56
Petro - Star	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fairbanks MUS (Aurora)	1.02	1.05	1.06	1.07	1.08	1.09	1.10	1.11	1.12	1.13	1.14
Alyeska Pump Station #8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL Point Sources	**3.08**	**3.18**	**3.21**	**3.23**	**3.26**	**3.29**	**3.32**	**3.35**	**3.38**	**3.41**	**3.44**
Mobile Sources											
Initial Idle Emissions	7.45	6.74	6.14	5.92	5.65	5.66	5.40	5.28	5.20	5.15	5.07
Traveling Emissions	17.83	16.39	15.12	14.36	13.60	15.65	15.17	14.77	14.51	14.32	14.12
TOTAL On-Road Mobile Sources	**25.28**	**23.13**	**21.26**	**20.28**	**19.25**	**21.31**	**20.57**	**20.05**	**19.71**	**19.47**	**19.19**
GRAND TOTAL	**34.30**	**32.45**	**30.73**	**29.85**	**28.92**	**31.09**	**30.45**	**30.03**	**29.79**	**29.65**	**29.48**

* does not include emissions from locomotive engines.

Table 6-2
Fairbanks 2005-2015 CO Emissions Inventory
Percentage Contribution by Source Category

Source Category	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Nonroad Sources	9%	10%	11%	11%	12%	11%	11%	12%	12%	12%	12%
Area Sources	8%	9%	10%	10%	11%	10%	10%	10%	11%	11%	11%
Point Sources	9%	10%	10%	11%	11%	11%	11%	11%	11%	11%	12%
On-road Mobile Sources	74%	71%	69%	68%	67%	69%	68%	67%	66%	66%	65%
TOTAL	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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7. REFERENCES

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7. “Fairbanks Cold Temperature Vehicle Testing: Warmup Idle, Between-trip Idle and Plug-In,” prepared by Sierra Research for the Alaska Department of Environmental Conservation, Report No. SR01-07-01B, July 2001.

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15. Air Quality/Transportation Plan Conformity, Fairbanks Maintenance Area, FFY06-08 TIP and LRTP, Approved August 17, 2005

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18. Mixing height data from the National Climatic Data Center (NCDC), Asheville, North Carolina, EPA Support Center for Regulatory Air Models (SCRAM) website, http://www.epa.gov/ttn/scram.

19. Airline On-Time Performance Data, U.S. Bureau of Transportation Statistics, http://www.transtats.bts.gov/Databases.asp?Mode_ID=1&Mode_Desc=Aviation&Subject_ID2=0.

20. Communication with Daryl Avera, Airport Operations, Fairbanks International Airport, March 2001.

21. Communication with Eric Dick, Department of Army, Environmental Engineer, Fort Wainwright, August 2006.

22. Communication with Brian Phearson, Grounds Supervisor, Alaska Airlines, Fairbanks International Airport, February - March 2001.

23. "Area Source Methodologies Manual," California Air Resources Board, June 1994.

APPENDIX A

MOBILE6 INPUT FILES

FCVMTWIM.in - Fairbanks input file assuming continued I/M

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************************************************************

* 2005-2018 INV PROJECTIONS
* FAIRBANKS URBAN NONATTAINMENT AREA -- WINTER CO
* CONTINUE I/M, 4-YEAR I/M EXEMPTION (GRACE PERIOD)
* BASELINE (2005) FUEL SULFUR AT 150 PPM (PER LSG STUDY)
* LD REG FRACTIONS WITH AGE FROM 2000 PARKING LOT SURVEY
* UPDATED LD MILEAGE ACCUM RATES FROM 2005 I/M DATA
* USE CONSTANT 2005-BASED VMT FOR ALL YEARS
*
*******************  Header Section  ************************
MOBILE6 INPUT FILE :
POLLUTANTS         : CO
SPREADSHEET        :

RUN DATA           :
*******************  Run Section  ***************************
* I/M Program -- Idle/2500 Testing for MY75-MY95
I/M PROGRAM        : 1 1985 2020 2 TRC 2500/IDLE
I/M MODEL YEARS    : 1 1975 1995
I/M VEHICLES       : 1 22222 11111111 1
I/M STRINGENCY     : 1 23.0
I/M COMPLIANCE     : 1 96.0
I/M GRACE PERIOD   : 1 4
I/M WAIVER RATES   : 1 0.0 0.0
I/M EFFECTIVENESS  : 1.00 1.00 1.00

I/M PROGRAM        : 2 1985 2020 2 TRC 2500/IDLE
I/M MODEL YEARS    : 2 1975 2020
I/M VEHICLES       : 2 11111 22111111 2
I/M STRINGENCY     : 2 23.0
I/M COMPLIANCE     : 2 96.0
I/M GRACE PERIOD   : 2 4
I/M WAIVER RATES   : 2 0.0 0.0
I/M EFFECTIVENESS  : 1.00 1.00 1.00

* I/M Program -- OBD Testing for MY96+ in 2001+
I/M PROGRAM        : 3 1985 2020  2 TRC OBD I/M
I/M MODEL YEARS    : 3 1996 2020
I/M VEHICLES       : 3 22222 11111111 1
I/M STRINGENCY     : 3 23.0
I/M COMPLIANCE     : 3 96.0
I/M GRACE PERIOD   : 3 4
I/M WAIVER RATES   : 3 0.0 0.0

* Anti-Tampering Program for MY1975+
ANTI-TAMP PROG     :
85 75 20 22222 22111111 2 12 096. 22112221

FUEL RVP           : 14.4

* CY2002-04 Fuel sulfur data based on Williams levels reported by AK
* refiners. (email from Wayne Elson 10/1/03) - SSD
* CY2005-06 fuel sulfur data from Flint Hills Resources tests of
* "baseline" fuel conducted during 2005-06 LSG study - TRC
*
*2000   2001   2002   2003   2004   2005   2006  2007   AVG PPM S
*2008   2009   2010   2011   2012   2013   2014  2015+  AVG PPM S
*2000   2001   2002   2003   2004   2005   2006  2007   MAX PPM S
*2008   2009   2010   2011   2012   2013   2014  2015+  MAX PPM S

FUEL PROGRAM       : 4
```

```
112.0  132.0  193.0  193.0  193.0  164.0  164.0  60.0
 30.0   30.0   30.0   30.0   30.0   30.0   30.0  30.0
213.0  233.0  288.0  288.0  288.0  200.0  200.0  80.0
 80.0   80.0   80.0   80.0   80.0   80.0   80.0  80.0

MILE ACCUM RATE    : FMAR05W.PRN
REG DIST           : FREG05W.PRN

* CY2005 (1/2006)
*  LDV   LDT1   LDT2   LDT3   LDT4  HDV2B   HDV3   HDV4   HDV5   HDV6   HDV7
HDV8A  HDV8B   HDBS   HDBT     MC
VMT FRACTIONS      :
0.2765 0.0681 0.2267 0.1253 0.0576 0.0793 0.0078 0.0063 0.0047 0.0176 0.0208
0.0227 0.0808 0.0040 0.0018 0.0000

*******************  Scenario Section  **********************
* A separate scenario must be written for each calendar
* year to be analyzed.

******************** 2002 Scenarios ************************
SCENARIO RECORD    : Winter2002- HBW1
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBW2
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBW3
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBW4
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBW5
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
```

```
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBW6
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBW7
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBO1
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBO2
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBO3
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBO4
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- NHB1
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
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NO SFTP SPEED       :

SCENARIO RECORD     : Winter2002- NHB2
CALENDAR YEAR       : 2003
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2002- NHB3
CALENDAR YEAR       : 2003
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

********************* 2003 Scenarios ************************
SCENARIO RECORD     : Winter2003- HBW1
CALENDAR YEAR       : 2004
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2003- HBW2
CALENDAR YEAR       : 2004
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2003- HBW3
CALENDAR YEAR       : 2004
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2003- HBW4
CALENDAR YEAR       : 2004
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2003- HBW5
CALENDAR YEAR       : 2004
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
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```
> INITIAL IDLE       : S, 8, 5, 0
NO SFTP SPEED        :

SCENARIO RECORD      : Winter2003- HBW6
CALENDAR YEAR        : 2004
MIN/MAX TEMP         : 20.0 20.0
EVALUATION MONTH     : 1
AVERAGE SPEED        : 35.7 Areawide
SOAK DISTRIBUTION    : SOAKDST.004
> INITIAL IDLE       : S, 4, 5, 1
NO SFTP SPEED        :

SCENARIO RECORD      : Winter2003- HBW7
CALENDAR YEAR        : 2004
MIN/MAX TEMP         : 20.0 20.0
EVALUATION MONTH     : 1
AVERAGE SPEED        : 35.7 Areawide
SOAK DISTRIBUTION    : SOAKDST.004
> INITIAL IDLE       : S, 4, 5, 0
NO SFTP SPEED        :

SCENARIO RECORD      : Winter2003- HBO1
CALENDAR YEAR        : 2004
MIN/MAX TEMP         : 50.0 50.0
EVALUATION MONTH     : 1
AVERAGE SPEED        : 35.7 Areawide
SOAK DISTRIBUTION    : SOAKDST.012
> INITIAL IDLE       : S, 12, 0.5, 0
NO SFTP SPEED        :

SCENARIO RECORD      : Winter2003- HBO2
CALENDAR YEAR        : 2004
MIN/MAX TEMP         : 20.0 20.0
EVALUATION MONTH     : 1
AVERAGE SPEED        : 35.7 Areawide
SOAK DISTRIBUTION    : SOAKDST.012
> INITIAL IDLE       : S, 12, 5, 1
NO SFTP SPEED        :

SCENARIO RECORD      : Winter2003- HBO3
CALENDAR YEAR        : 2004
MIN/MAX TEMP         : 20.0 20.0
EVALUATION MONTH     : 1
AVERAGE SPEED        : 35.7 Areawide
SOAK DISTRIBUTION    : SOAKDST.012
> INITIAL IDLE       : S, 12, 5, 0
NO SFTP SPEED        :

SCENARIO RECORD      : Winter2003- HBO4
CALENDAR YEAR        : 2004
MIN/MAX TEMP         : 20.0 20.0
EVALUATION MONTH     : 1
AVERAGE SPEED        : 35.7 Areawide
SOAK DISTRIBUTION    : SOAKDST.002
> INITIAL IDLE       : S, 2, 5, 0
NO SFTP SPEED        :

SCENARIO RECORD      : Winter2003- NHB1
CALENDAR YEAR        : 2004
MIN/MAX TEMP         : 20.0 20.0
EVALUATION MONTH     : 1
AVERAGE SPEED        : 35.7 Areawide
SOAK DISTRIBUTION    : SOAKDST.HLF
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> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2003- NHB2
CALENDAR YEAR       : 2004
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2003- NHB3
CALENDAR YEAR       : 2004
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

********************* 2004 Scenarios ************************
SCENARIO RECORD     : Winter2004- HBW1
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2004- HBW2
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2004- HBW3
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2004- HBW4
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2004- HBW5
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
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SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBW6
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBW7
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBO1
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBO2
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBO3
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBO4
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- NHB1
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
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SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- NHB2
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- NHB3
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

******************** 2005 Scenarios ***********************
SCENARIO RECORD    : Winter2005- HBW1
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBW2
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBW3
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBW4
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBW5
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
```

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AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBW6
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBW7
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBO1
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBO2
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBO3
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBO4
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- NHB1
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
```

```
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- NHB2
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- NHB3
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2006 Scenarios ************************
SCENARIO RECORD    : Winter2006- HBW1
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBW2
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBW3
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBW4
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBW5
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
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EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBW6
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBW7
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBO1
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBO2
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBO3
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBO4
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- NHB1
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
```

```
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- NHB2
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- NHB3
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2007 Scenarios ************************
SCENARIO RECORD    : Winter2007- HBW1
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBW2
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBW3
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBW4
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBW5
CALENDAR YEAR      : 2008
```

```
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBW6
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBW7
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBO1
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBO2
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBO3
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- HBO4
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- NHB1
CALENDAR YEAR      : 2008
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- NHB2
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2007- NHB3
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2008 Scenarios ************************
SCENARIO RECORD    : Winter2008- HBW1
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW2
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW3
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW4
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW5
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW6
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW7
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBO1
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBO2
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBO3
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBO4
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- NHB1
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- NHB2
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- NHB3
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2009 Scenarios ************************
SCENARIO RECORD    : Winter2009- HBW1
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- HBW2
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- HBW3
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- HBW4
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
SCENARIO RECORD    : Winter2009- HBW5
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- HBW6
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- HBW7
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- HBO1
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- HBO2
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- HBO3
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- HBO4
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
SCENARIO RECORD    : Winter2009- NHB1
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- NHB2
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2009- NHB3
CALENDAR YEAR      : 2010
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2010 Scenarios ************************
SCENARIO RECORD    : Winter2010- HBW1
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW2
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW3
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW4
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
SCENARIO RECORD    : Winter2010- HBW5
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW6
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW7
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBO1
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBO2
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBO3
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBO4
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
SCENARIO RECORD    : Winter2010- NHB1
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- NHB2
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- NHB3
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2011 Scenarios ************************
SCENARIO RECORD    : Winter2011- HBW1
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBW2
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBW3
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBW4
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
```

```
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBW5
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBW6
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBW7
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBO1
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBO2
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBO3
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBO4
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
```

```
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- NHB1
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- NHB2
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- NHB3
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2012 Scenarios ************************
SCENARIO RECORD    : Winter2012- HBW1
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBW2
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBW3
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBW4
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
```

```
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- HBW5
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- HBW6
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- HBW7
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- HBO1
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- HBO2
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- HBO3
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- HBO4
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
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> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- NHB1
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- NHB2
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2012- NHB3
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

********************* 2013 Scenarios ************************
SCENARIO RECORD     : Winter2013- HBW1
CALENDAR YEAR       : 2014
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2013- HBW2
CALENDAR YEAR       : 2014
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2013- HBW3
CALENDAR YEAR       : 2014
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2013- HBW4
CALENDAR YEAR       : 2014
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
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SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBW5
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBW6
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBW7
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBO1
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBO2
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBO3
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBO4
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
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```
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- NHB1
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- NHB2
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- NHB3
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

******************** 2014 Scenarios ************************
SCENARIO RECORD    : Winter2014- HBW1
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBW2
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBW3
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBW4
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
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AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBW5
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBW6
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBW7
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBO1
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBO2
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBO3
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- HBO4
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
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AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- NHB1
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- NHB2
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2014- NHB3
CALENDAR YEAR      : 2015
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2015 Scenarios ************************
SCENARIO RECORD    : Winter2015- HBW1
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW2
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW3
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW4
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
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EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW5
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW6
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW7
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBO1
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBO2
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBO3
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBO4
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
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EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- NHB1
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- NHB2
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- NHB3
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

******************** 2016 Scenarios ************************
SCENARIO RECORD    : Winter2016- HBW1
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW2
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW3
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW4
CALENDAR YEAR      : 2017
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MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW5
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW6
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW7
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBO1
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBO2
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBO3
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBO4
CALENDAR YEAR      : 2017
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```
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- NHB1
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- NHB2
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- NHB3
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

******************** 2017 Scenarios ************************
SCENARIO RECORD    : Winter2017- HBW1
CALENDAR YEAR      : 2018
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2017- HBW2
CALENDAR YEAR      : 2018
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2017- HBW3
CALENDAR YEAR      : 2018
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2017- HBW4
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CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBW5
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBW6
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBW7
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBO1
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBO2
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBO3
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBO4
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
CALENDAR YEAR      : 2018
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2017- NHB1
CALENDAR YEAR      : 2018
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2017- NHB2
CALENDAR YEAR      : 2018
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2017- NHB3
CALENDAR YEAR      : 2018
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2018 Scenarios ************************
SCENARIO RECORD    : Winter2018- HBW1
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- HBW2
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- HBW3
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
SCENARIO RECORD    : Winter2018- HBW4
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- HBW5
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- HBW6
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- HBW7
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- HBO1
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- HBO2
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- HBO3
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :
```

FCVMTWIM.in - Fairbanks input file assuming continued I/M

```
SCENARIO RECORD    : Winter2018- HBO4
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- NHB1
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- NHB2
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2018- NHB3
CALENDAR YEAR      : 2019
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

*******************  End of Run  ****************************
END OF RUN
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
*************************************************************
* 2005-2018 INV PROJECTIONS
* FAIRBANKS URBAN NONATTAINMENT AREA -- WINTER CO
* NO I/M PROGRAM
* BASELINE (2005) FUEL SULFUR AT 150 PPM (PER LSG STUDY)
* LD REG FRACTIONS WITH AGE FROM 2000 PARKING LOT SURVEY
* UPDATED LD MILEAGE ACCUM RATES FROM 2005 I/M DATA
* USE CONSTANT 2005-BASED VMT FOR ALL YEARS
*
*******************  Header Section  ************************
MOBILE6 INPUT FILE :
POLLUTANTS         : CO
SPREADSHEET        :

RUN DATA           :
*******************  Run Section  ***************************

FUEL RVP           : 14.4

* CY2002-04 Fuel sulfur data based on Williams levels reported by AK
* refiners. (email from Wayne Elson 10/1/03) - SSD
* CY2005-06 fuel sulfur data from Flint Hills Resources tests of
* "baseline" fuel conducted during 2005-06 LSG study - TRC
*
*2000   2001   2002   2003   2004   2005   2006  2007   AVG PPM S
*2008   2009   2010   2011   2012   2013   2014  2015+  AVG PPM S
*2000   2001   2002   2003   2004   2005   2006  2007   MAX PPM S
*2008   2009   2010   2011   2012   2013   2014  2015+  MAX PPM S

FUEL PROGRAM       : 4
112.0  132.0  193.0  193.0  193.0  164.0  164.0  60.0
 30.0   30.0   30.0   30.0   30.0   30.0   30.0  30.0
213.0  233.0  288.0  288.0  288.0  200.0  200.0  80.0
 80.0   80.0   80.0   80.0   80.0   80.0   80.0  80.0

MILE ACCUM RATE    : FMAR05W.PRN
REG DIST           : FREG05W.PRN

* CY2005 (1/2006)
*  LDV   LDT1   LDT2   LDT3   LDT4  HDV2B   HDV3   HDV4   HDV5   HDV6   HDV7
HDV8A  HDV8B   HDBS   HDBT     MC
VMT FRACTIONS      :
0.2765 0.0681 0.2267 0.1253 0.0576 0.0793 0.0078 0.0063 0.0047 0.0176 0.0208
0.0227 0.0808 0.0040 0.0018 0.0000

*******************  Scenario Section  **********************
* A separate scenario must be written for each calendar
* year to be analyzed.

******************** 2002 Scenarios ************************
SCENARIO RECORD    : Winter2002- HBW1
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBW2
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
```

```
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2002- HBW3
CALENDAR YEAR       : 2003
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2002- HBW4
CALENDAR YEAR       : 2003
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2002- HBW5
CALENDAR YEAR       : 2003
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2002- HBW6
CALENDAR YEAR       : 2003
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2002- HBW7
CALENDAR YEAR       : 2003
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2002- HBO1
CALENDAR YEAR       : 2003
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2002- HBO2
CALENDAR YEAR       : 2003
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
```

```
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBO3
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- HBO4
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- NHB1
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- NHB2
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2002- NHB3
CALENDAR YEAR      : 2003
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2003 Scenarios ************************
SCENARIO RECORD    : Winter2003- HBW1
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBW2
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBW3
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBW4
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBW5
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBW6
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBW7
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBO1
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBO2
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBO3
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- HBO4
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- NHB1
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- NHB2
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2003- NHB3
CALENDAR YEAR      : 2004
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2004 Scenarios ************************
SCENARIO RECORD    : Winter2004- HBW1
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBW2
CALENDAR YEAR      : 2005
```

```
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBW3
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBW4
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBW5
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBW6
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBW7
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBO1
CALENDAR YEAR      : 2005
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2004- HBO2
CALENDAR YEAR      : 2005
```

```
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2004- HBO3
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2004- HBO4
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2004- NHB1
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2004- NHB2
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2004- NHB3
CALENDAR YEAR       : 2005
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

********************* 2005 Scenarios ************************
SCENARIO RECORD     : Winter2005- HBW1
CALENDAR YEAR       : 2006
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2005- HBW2
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
CALENDAR YEAR       : 2006
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2005- HBW3
CALENDAR YEAR       : 2006
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2005- HBW4
CALENDAR YEAR       : 2006
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2005- HBW5
CALENDAR YEAR       : 2006
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2005- HBW6
CALENDAR YEAR       : 2006
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2005- HBW7
CALENDAR YEAR       : 2006
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2005- HBO1
CALENDAR YEAR       : 2006
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.6 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2005- HBO2
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBO3
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- HBO4
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- NHB1
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- NHB2
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2005- NHB3
CALENDAR YEAR      : 2006
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.6 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2006 Scenarios ************************
SCENARIO RECORD    : Winter2006- HBW1
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
SCENARIO RECORD     : Winter2006- HBW2
CALENDAR YEAR       : 2007
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2006- HBW3
CALENDAR YEAR       : 2007
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2006- HBW4
CALENDAR YEAR       : 2007
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2006- HBW5
CALENDAR YEAR       : 2007
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2006- HBW6
CALENDAR YEAR       : 2007
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2006- HBW7
CALENDAR YEAR       : 2007
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2006- HBO1
CALENDAR YEAR       : 2007
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
SCENARIO RECORD    : Winter2006- HBO2
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBO3
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- HBO4
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- NHB1
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- NHB2
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2006- NHB3
CALENDAR YEAR      : 2007
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2007 Scenarios ************************
SCENARIO RECORD    : Winter2007- HBW1
CALENDAR YEAR      : 2008
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
SCENARIO RECORD     : Winter2007- HBW2
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- HBW3
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- HBW4
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- HBW5
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- HBW6
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- HBW7
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- HBO1
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
SCENARIO RECORD     : Winter2007- HBO2
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- HBO3
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- HBO4
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- NHB1
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- NHB2
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2007- NHB3
CALENDAR YEAR       : 2008
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

********************* 2008 Scenarios ************************
SCENARIO RECORD     : Winter2008- HBW1
CALENDAR YEAR       : 2009
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
```

```
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW2
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW3
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW4
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW5
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW6
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBW7
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2008- HBO1
CALENDAR YEAR      : 2009
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
```

```
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2008- HBO2
CALENDAR YEAR       : 2009
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2008- HBO3
CALENDAR YEAR       : 2009
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2008- HBO4
CALENDAR YEAR       : 2009
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2008- NHB1
CALENDAR YEAR       : 2009
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2008- NHB2
CALENDAR YEAR       : 2009
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2008- NHB3
CALENDAR YEAR       : 2009
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

******************** 2009 Scenarios ***********************
SCENARIO RECORD     : Winter2009- HBW1
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
```

```
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBW2
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBW3
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBW4
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBW5
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBW6
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBW7
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBO1
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
```

```
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBO2
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBO3
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- HBO4
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- NHB1
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- NHB2
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2009- NHB3
CALENDAR YEAR       : 2010
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

********************* 2010 Scenarios ************************
SCENARIO RECORD     : Winter2010- HBW1
CALENDAR YEAR       : 2011
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
```

```
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW2
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW3
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW4
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW5
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW6
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBW7
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBO1
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBO2
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBO3
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- HBO4
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- NHB1
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- NHB2
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2010- NHB3
CALENDAR YEAR      : 2011
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2011 Scenarios ************************
SCENARIO RECORD    : Winter2011- HBW1
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBW2
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBW3
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBW4
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBW5
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBW6
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBW7
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2011- HBO1
CALENDAR YEAR      : 2012
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
```

```
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBO2
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBO3
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- HBO4
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- NHB1
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- NHB2
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2011- NHB3
CALENDAR YEAR       : 2012
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

********************* 2012 Scenarios ************************
SCENARIO RECORD     : Winter2012- HBW1
CALENDAR YEAR       : 2013
MIN/MAX TEMP        : 50.0 50.0
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBW2
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBW3
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBW4
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBW5
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBW6
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBW7
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBO1
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 50.0 50.0
```

```
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBO2
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBO3
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- HBO4
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- NHB1
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- NHB2
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2012- NHB3
CALENDAR YEAR      : 2013
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

******************** 2013 Scenarios ***********************
SCENARIO RECORD    : Winter2013- HBW1
CALENDAR YEAR      : 2014
```

```
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBW2
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBW3
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBW4
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBW5
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBW6
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBW7
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBO1
CALENDAR YEAR      : 2014
```

```
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBO2
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBO3
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- HBO4
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- NHB1
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- NHB2
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2013- NHB3
CALENDAR YEAR      : 2014
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.7 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :

********************* 2014 Scenarios ************************
SCENARIO RECORD    : Winter2014- HBW1
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBW2
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBW3
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBW4
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBW5
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBW6
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBW7
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBO1
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBO2
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBO3
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- HBO4
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- NHB1
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- NHB2
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2014- NHB3
CALENDAR YEAR       : 2015
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.7 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

********************* 2015 Scenarios ************************
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
SCENARIO RECORD    : Winter2015- HBW1
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW2
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW3
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW4
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW5
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW6
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBW7
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
SCENARIO RECORD    : Winter2015- HBO1
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBO2
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBO3
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- HBO4
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- NHB1
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.HLF
> INITIAL IDLE     : S, 0.5, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- NHB2
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.001
> INITIAL IDLE     : S, 1, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2015- NHB3
CALENDAR YEAR      : 2016
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.002
> INITIAL IDLE     : S, 2, 1, 0
NO SFTP SPEED      :
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
******************** 2016 Scenarios ***********************
SCENARIO RECORD    : Winter2016- HBW1
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 50.0 50.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 0.5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW2
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW3
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.012
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW4
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW5
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.008
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW6
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 1
NO SFTP SPEED      :

SCENARIO RECORD    : Winter2016- HBW7
CALENDAR YEAR      : 2017
MIN/MAX TEMP       : 20.0 20.0
EVALUATION MONTH   : 1
AVERAGE SPEED      : 35.8 Areawide
SOAK DISTRIBUTION  : SOAKDST.004
> INITIAL IDLE     : S, 4, 5, 0
NO SFTP SPEED      :
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
SCENARIO RECORD     : Winter2016- HBO1
CALENDAR YEAR       : 2017
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2016- HBO2
CALENDAR YEAR       : 2017
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2016- HBO3
CALENDAR YEAR       : 2017
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2016- HBO4
CALENDAR YEAR       : 2017
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2016- NHB1
CALENDAR YEAR       : 2017
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2016- NHB2
CALENDAR YEAR       : 2017
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2016- NHB3
CALENDAR YEAR       : 2017
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :
```

```
******************** 2017 Scenarios ***********************
SCENARIO RECORD     : Winter2017- HBW1
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBW2
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBW3
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBW4
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBW5
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBW6
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBW7
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 0
```

```
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBO1
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBO2
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBO3
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- HBO4
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- NHB1
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- NHB2
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2017- NHB3
CALENDAR YEAR       : 2018
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 1, 0
```

```
NO SFTP SPEED       :

******************** 2018 Scenarios ***********************
SCENARIO RECORD     : Winter2018- HBW1
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBW2
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBW3
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBW4
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBW5
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.008
> INITIAL IDLE      : S, 8, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBW6
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
> INITIAL IDLE      : S, 4, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBW7
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.004
```

```
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBO1
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 50.0 50.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBO2
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 1
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBO3
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.012
> INITIAL IDLE      : S, 12, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- HBO4
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- NHB1
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.HLF
> INITIAL IDLE      : S, 0.5, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- NHB2
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.001
> INITIAL IDLE      : S, 1, 0.5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : Winter2018- NHB3
CALENDAR YEAR       : 2019
MIN/MAX TEMP        : 20.0 20.0
EVALUATION MONTH    : 1
AVERAGE SPEED       : 35.8 Areawide
SOAK DISTRIBUTION   : SOAKDST.002
```

FCVMTWNO.in – Fairbanks input file assuming no I/M program

```
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

*******************  End of Run  ****************************
END OF RUN
```

FREG05W.prn - Updated Fairbanks wintertime fleet age distributions

```
REG DIST
*
*      Fairbanks 2005 Winter Fleet Reg Distribution with Age
*
* LDV   2000 Parking Lot Survey (LDV)
      1 0.05457 0.07276 0.08747 0.08445 0.06610 0.08747 0.06837 0.07767 0.05781 0.06208 0.06083 0.04499 0.03217
0.03041 0.02564 0.02564 0.01810 0.01257 0.00402 0.00402 0.00126 0.00427 0.00176 0.00226 0.01331
* LDT1  2000 Parking Lot Survey (LDT)
      2 0.04984 0.06645 0.06361 0.06891 0.06437 0.07118 0.09238 0.05376 0.04922 0.06285 0.05528 0.04998 0.04241
0.02878 0.02650 0.03256 0.01893 0.01515 0.00833 0.01515 0.00682 0.00909 0.00682 0.00909 0.03254
* LDT2  2000 Parking Lot Survey (LDT)
      3 0.04984 0.06645 0.06361 0.06891 0.06437 0.07118 0.09238 0.05376 0.04922 0.06285 0.05528 0.04998 0.04241
0.02878 0.02650 0.03256 0.01893 0.01515 0.00833 0.01515 0.00682 0.00909 0.00682 0.00909 0.03254
* LDT3  2000 Parking Lot Survey (LDT)
      4 0.04984 0.06645 0.06361 0.06891 0.06437 0.07118 0.09238 0.05376 0.04922 0.06285 0.05528 0.04998 0.04241
0.02878 0.02650 0.03256 0.01893 0.01515 0.00833 0.01515 0.00682 0.00909 0.00682 0.00909 0.03254
* LDT4  2000 Parking Lot Survey (LDT)
      5 0.04984 0.06645 0.06361 0.06891 0.06437 0.07118 0.09238 0.05376 0.04922 0.06285 0.05528 0.04998 0.04241
0.02878 0.02650 0.03256 0.01893 0.01515 0.00833 0.01515 0.00682 0.00909 0.00682 0.00909 0.03254
* HDV2B MOBILE6 Default
      6 0.05030 0.09160 0.08330 0.07580 0.06900 0.06270 0.05710 0.05190 0.04720 0.04300 0.03910 0.03560 0.03240
0.02940 0.02680 0.02440 0.02220 0.02020 0.01840 0.01670 0.01520 0.01380 0.01260 0.01140 0.04990
* HDV3  MOBILE6 Default
      7 0.05030 0.09160 0.08330 0.07580 0.06900 0.06270 0.05710 0.05190 0.04720 0.04300 0.03910 0.03560 0.03240
0.02940 0.02680 0.02440 0.02220 0.02020 0.01840 0.01670 0.01520 0.01380 0.01260 0.01140 0.04990
* HDV4  MOBILE6 Default
      8 0.03880 0.07260 0.06790 0.06350 0.05940 0.05560 0.05200 0.04860 0.04550 0.04250 0.03980 0.03720 0.03480
0.03260 0.03040 0.02850 0.02660 0.02490 0.02330 0.02180 0.02040 0.01910 0.01780 0.01670 0.07970
* HDV5  MOBILE6 Default
      9 0.03880 0.07260 0.06790 0.06350 0.05940 0.05560 0.05200 0.04860 0.04550 0.04250 0.03980 0.03720 0.03480
0.03260 0.03040 0.02850 0.02660 0.02490 0.02330 0.02180 0.02040 0.01910 0.01780 0.01670 0.07970
* HDV6  MOBILE6 Default
     10 0.03880 0.07260 0.06790 0.06350 0.05940 0.05560 0.05200 0.04860 0.04550 0.04250 0.03980 0.03720 0.03480
0.03260 0.03040 0.02850 0.02660 0.02490 0.02330 0.02180 0.02040 0.01910 0.01780 0.01670 0.07970
* HDV7  MOBILE6 Default
     11 0.03880 0.07260 0.06790 0.06350 0.05940 0.05560 0.05200 0.04860 0.04550 0.04250 0.03980 0.03720 0.03480
0.03260 0.03040 0.02850 0.02660 0.02490 0.02330 0.02180 0.02040 0.01910 0.01780 0.01670 0.07970
* HDV8a MOBILE6 Default
     12 0.03880 0.07260 0.06790 0.06350 0.05940 0.05560 0.05200 0.04860 0.04550 0.04250 0.03980 0.03720 0.03480
0.03260 0.03040 0.02850 0.02660 0.02490 0.02330 0.02180 0.02040 0.01910 0.01780 0.01670 0.07970
* HDV8b MOBILE6 Default
     13 0.03880 0.07260 0.06790 0.06350 0.05940 0.05560 0.05200 0.04860 0.04550 0.04250 0.03980 0.03720 0.03480
0.03260 0.03040 0.02850 0.02660 0.02490 0.02330 0.02180 0.02040 0.01910 0.01780 0.01670 0.07970
* HDBS  MOBILE6 Default
     14 0.03930 0.07340 0.06860 0.06410 0.05990 0.05590 0.05220 0.04880 0.04560 0.04260 0.03980 0.03720 0.03470
0.03240 0.03030 0.02830 0.02640 0.02470 0.02310 0.02160 0.02010 0.01880 0.01760 0.01650 0.07810
* HDBT  MOBILE6 Default
     15 0.03070 0.06140 0.06140 0.06140 0.06140 0.06140 0.06140 0.06140 0.06140 0.06130 0.06110 0.06070 0.05950
0.05680 0.05110 0.04060 0.02540 0.01210 0.00990 0.00810 0.00660 0.00540 0.00440 0.00370 0.01140
* MC    MOBILE6 Default
     16 0.14400 0.16800 0.13500 0.10900 0.08800 0.07000 0.05600 0.04500 0.03600 0.02900 0.02300 0.09700 0.00000
0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
```

MILE ACCUM RATES
*
* Fairbanks 2005 Winter Fleet Mileage Accumulation Rates with Age
*
* LDGV I/M Data
1 0.16150 0.15105 0.14128 0.13215 0.12360 0.11561 0.10813 0.10114 0.09460 0.08848 0.08276 0.07741 0.07240 0.06772 0.06334 0.05925 0.05542 0.05183 0.04848 0.04534 0.04241 0.03967 0.03710 0.03471 0.03246
* LDGT1 I/M Data
2 0.16795 0.15793 0.14850 0.13963 0.13130 0.12346 0.11609 0.10916 0.10265 0.09652 0.09076 0.08534 0.08024 0.07545 0.07095 0.06671 0.06273 0.05899 0.05547 0.05215 0.04904 0.04611 0.04336 0.04077 0.03834
* LDGT2 I/M Data
3 0.16795 0.15793 0.14850 0.13963 0.13130 0.12346 0.11609 0.10916 0.10265 0.09652 0.09076 0.08534 0.08024 0.07545 0.07095 0.06671 0.06273 0.05899 0.05547 0.05215 0.04904 0.04611 0.04336 0.04077 0.03834
* LDGT3 I/M Data
4 0.18652 0.17436 0.16300 0.15237 0.14244 0.13316 0.12448 0.11637 0.10878 0.10169 0.09506 0.08887 0.08308 0.07766 0.07260 0.06787 0.06344 0.05931 0.05544 0.05183 0.04845 0.04529 0.04234 0.03958 0.03700
* LDGT4 I/M Data
5 0.18652 0.17436 0.16300 0.15237 0.14244 0.13316 0.12448 0.11637 0.10878 0.10169 0.09506 0.08887 0.08308 0.07766 0.07260 0.06787 0.06344 0.05931 0.05544 0.05183 0.04845 0.04529 0.04234 0.03958 0.03700
* HDGV2b MOBILE6 Default
6 0.19977 0.18779 0.17654 0.16596 0.15601 0.14666 0.13787 0.12961 0.12184 0.11454 0.10768 0.10122 0.09516 0.08946 0.08409 0.07905 0.07432 0.06986 0.06568 0.06174 0.05804 0.05456 0.05129 0.04822 0.04533
* HDGV3 MOBILE6 Default
7 0.19977 0.18779 0.17654 0.16596 0.15601 0.14666 0.13787 0.12961 0.12184 0.11454 0.10768 0.10122 0.09516 0.08946 0.08409 0.07905 0.07432 0.06986 0.06568 0.06174 0.05804 0.05456 0.05129 0.04822 0.04533
* HDGV4 MOBILE6 Default
8 0.21394 0.19692 0.14400 0.16683 0.15356 0.14134 0.13010 0.11975 0.11022 0.10145 0.09338 0.08595 0.07911 0.07282 0.06169 0.06169 0.05679 0.05227 0.04811 0.04428 0.04076 0.03752 0.03453 0.03178 0.02926
* HDGV5 MOBILE6 Default
9 0.21394 0.19692 0.14400 0.16683 0.15356 0.14134 0.13010 0.11975 0.11022 0.10145 0.09338 0.08595 0.07911 0.07282 0.06169 0.06169 0.05679 0.05227 0.04811 0.04428 0.04076 0.03752 0.03453 0.03178 0.02926
* HDGV6 MOBILE6 Default
10 0.21394 0.19692 0.14400 0.16683 0.15356 0.14134 0.13010 0.11975 0.11022 0.10145 0.09338 0.08595 0.07911 0.07282 0.06169 0.06169 0.05679 0.05227 0.04811 0.04428 0.04076 0.03752 0.03453 0.03178 0.02926
* HDGV7 MOBILE6 Default
11 0.21394 0.19692 0.14400 0.16683 0.15356 0.14134 0.13010 0.11975 0.11022 0.10145 0.09338 0.08595 0.07911 0.07282 0.06169 0.06169 0.05679 0.05227 0.04811 0.04428 0.04076 0.03752 0.03453 0.03178 0.02926
* HDGV8a MOBILE6 Default
12 0.21394 0.19692 0.14400 0.16683 0.15356 0.14134 0.13010 0.11975 0.11022 0.10145 0.09338 0.08595 0.07911 0.07282 0.06169 0.06169 0.05679 0.05227 0.04811 0.04428 0.04076 0.03752 0.03453 0.03178 0.02926
* HDGV8b MOBILE6 Default
13 0.21394 0.19692 0.14400 0.16683 0.15356 0.14134 0.13010 0.11975 0.11022 0.10145 0.09338 0.08595 0.07911 0.07282 0.06169 0.06169 0.05679 0.05227 0.04811 0.04428 0.04076 0.03752 0.03453 0.03178 0.02926
* LDDV Set Same as LDGV (I/M Data)
14 0.16150 0.15105 0.14128 0.13215 0.12360 0.11561 0.10813 0.10114 0.09460 0.08848 0.08276 0.07741 0.07240 0.06772 0.06334 0.05925 0.05542 0.05183 0.04848 0.04534 0.04241 0.03967 0.03710 0.03471 0.03246
* LDDT12 MOBILE6 Default
15 0.27059 0.24384 0.21973 0.19801 0.17843 0.16079 0.14490 0.13057 0.11766 0.10603 0.09555 0.08610 0.07759 0.06992 0.06301 0.05678 0.05116 0.04610 0.04155 0.03744 0.03374 0.03040 0.02740 0.02469 0.02225
* HDDV2b MOBILE6 Default
16 0.27137 0.24831 0.22721 0.20791 0.19024 0.17407 0.15928 0.14575 0.13336 0.12203 0.11166 0.10217 0.09349 0.08555 0.07828 0.07163 0.06554 0.05997 0.05488 0.05021 0.04595 0.04204 0.03847 0.03520 0.03221
* HDDV3 MOBILE6 Default
17 0.32751 0.28984 0.25650 0.22699 0.20088 0.17778 0.15733 0.13923 0.12321 0.10904 0.09650 0.08540 0.07557 0.06688 0.05919 0.05238 0.04635 0.04102 0.03630 0.03213 0.02843 0.02516 0.02227 0.01971 0.01744
* HDDV4 MOBILE6 Default
18 0.30563 0.28622 0.26805 0.25103 0.23509 0.22016 0.20618 0.19309 0.18083 0.16935 0.15860 0.14853 0.13910 0.13026 0.12199 0.11425 0.10699 0.10020 0.09384 0.08788 0.08230 0.07707 0.07218 0.06760 0.06331
* HDDV5 MOBILE6 Default
19 0.30563 0.28622 0.26805 0.25103 0.23509 0.22016 0.20618 0.19309 0.18083 0.16935 0.15860 0.14853 0.13910 0.13026 0.12199 0.11425 0.10699 0.10020 0.09384 0.08788 0.08230 0.07707 0.07218 0.06760 0.06331
* HDDV6 MOBILE6 Default

20 0.40681 0.36872 0.33420 0.30291 0.27455 0.24885 0.22555 0.20443 0.18529 0.16795 0.15222 0.13797 0.12505 0.11335 0.10273 0.09312 0.08440 0.07650 0.06933 0.06284 0.05696 0.05163 0.04679 0.04241 0.03844
*   HDDV7   MOBILE6 Default
21 0.40681 0.36872 0.33420 0.30291 0.27455 0.24885 0.22555 0.20443 0.18529 0.16795 0.15222 0.13797 0.12505 0.11335 0.10273 0.09312 0.08440 0.07650 0.06933 0.06284 0.05696 0.05163 0.04679 0.04241 0.03844
*   HDDV8a MOBILE6 Default
22 0.87821 0.78257 0.69735 0.62141 0.55374 0.49343 0.43970 0.39181 0.34915 0.31112 0.27724 0.24705 0.22015 0.19617 0.17481 0.15577 0.13881 0.12369 0.11022 0.09822 0.08752 0.07799 0.06950 0.06193 0.05518
*   HDDV8b MOBILE6 Default
23 1.24208 1.12590 1.02060 0.92514 0.83861 0.76017 0.68907 0.62462 0.56620 0.51324 0.46523 0.42172 0.38228 0.34652 0.31411 0.28473 0.25810 0.23396 0.21208 0.19224 0.17426 0.15796 0.14319 0.12979 0.11765
*   MC   Zero in Winter
24 0.04786 0.04475 0.04164 0.03853 0.03543 0.03232 0.02921 0.02611 0.02300 0.01989 0.01678 0.01368 0.01368 0.01368 0.01368 0.01368 0.01368 0.01368 0.01368 0.01368 0.01368 0.01368 0.01368 0.01368 0.01368
*   HDGB   MOBILE6 Default
25 0.09939
*   HDDBT   MOBILE6 Default
26 0.45171 0.43731 0.42337 0.40987 0.39681 0.38416 0.37191 0.36005 0.34857 0.33746 0.32670 0.31629 0.30620 0.29644 0.28699 0.27784 0.26898 0.26041 0.25211 0.24407 0.23629 0.22875 0.22146 0.21440 0.20757
*   HDDBS   MOBILE6 Default
27 0.09939
*   LDDT34 MOBILE6 Default
28 0.26040 0.24018 0.22154 0.20434 0.18848 0.17385 0.16036 0.14791 0.13643 0.12584 0.11607 0.10706 0.09875 0.09109 0.08402 0.07749 0.07148 0.06593 0.06081 0.05609 0.05174 0.04772 0.04402 0.04060 0.03745

Memorandum
Summary of Inventory Revisions to the 2004 Fairbanks CO Maintenance Plan
October 25, 2007

October 25, 2007

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Memo to: Alice Edwards, ADEC

From: Bob Dulla, Tom Carlson and Lori Williams

Subject: Summary of Inventory Revisions to the 2004 Fairbanks CO Maintenance Plan

Since the development of the 2004 Fairbanks CO Maintenance Plan (MP), several methodological revisions have been applied and updated activity data were obtained that supersede elements of the CO inventory reflected in that earlier plan. These are summarized briefly in this memorandum. (More exhaustive explanations of each revision or data update are provided in the Fairbanks 2005-2015 CO Inventory and revised AKMOBILE6 User's Guide reports that accompany the 2007 Maintenance Plan.)

The revisions/updates to the CO inventory in the 2004 Plan are listed below and grouped by inventory sector: on-road mobile, non-road mobile, area, and point.

On-Road Mobile

- *AKMOBILE6 CO Model* – The AKMOBILE6 model was corrected (in Version 1.10E) to better represent relative CO emission benefits from plug-ins during initial idling. The earlier version of AKMOBILE6 only applied relative plug-in idle benefits reflective of a fully cold engine/catalyst based on test data that were collected under those conditions. The relative (plug-in vs. no plug-in) benefits are greatest when a vehicle is fully cold and diminish toward zero when a vehicle started fully warmed up (i.e., after a short soak). Since not all vehicles are started fully cold, this correction resulted in a slight increase in initial idle emissions from the 2004 MP inventory.

- *Vehicle Age Distributions* – Vehicle age distribution inputs for passenger cars and light-duty trucks were updated based on more recently collected parking lot survey data; the updated survey data were collected during winter 2005-2006. (The 2004 MP age distributions were based on parking lot surveys conducted during winter 1999-2000.)

- *Mileage Accumulation Rates* – The mileage accumulation rate inputs (i.e., annual mileage as a function of vehicle age) were revised using a larger and more recent sample of odometer readings from I/M data than used in the 2004 MP inventory. The revised analysis incorporated six years of data, which enabled odometer rollover and entry errors to be more clearly identified and corrected. The revised mileage rates reflect lower annual mileage for older vehicles than in the 2004 MP inventory, which reduces on-road CO emissions.

- *Fleet VMT Mix* – The mix or distribution of VMT (vehicle miles traveled) by vehicle type was updated based on a more recent (June 2006) version of DMV registration data than in the 2004 MP inventory. In addition, the newer DMV data were processed by ADEC through a robust VIN decoder that identified each vehicle's MOBILE-based vehicle type more correctly than in the 2004 MP inventory. The revised VMT mix contains a smaller fraction of passenger cars and a slightly larger fraction of light-duty trucks, which collectively result in a slight increase in CO emissions compared to the 2004 MP inventory.

- *I/M Program Termination* – The 2004 MP assumed a biennial I/M program in Fairbanks would continue for the entire planning horizon. This inventory reflects the Borough's decision to terminate the I/M program by December 31, 2009. Thus, unlike the 2004 MP, no I/M benefits are modeled in calendar years 2010 and later in this updated inventory.

- *I/M Grace Period* – Since the 2004 MP, the I/M grace period (i.e., the number of new model years exempted from testing) was increased from two to four years. This resulted in a very slight increase in fleet CO emissions.

- *Vehicle Activity and Population Forecasts* – The vehicle travel (daily VMT and trips) and person population forecasts from 2005-2015 were revised from those contained in the 2004 MP inventory to reflect the Fairbanks Long Range Transportation Plan (LRTP).

The net impact of these revisions on the on-road mobile source inventory (initial idling plus traveling emissions) was a 3% reduction in base year (2005) CO emissions compared to the 2004 MP.

Non-Road Mobile

- *EDMS Airport Emission Factor Model* – A newer version of the EDMS model (4.5) released after the 2004 MP inventory was employed to compute aircraft and ground support equipment (GSE) emission factors. This version of EDMS incorporated updated emission factors from EPA's NONROAD model and resulted in lower emission factors, on average, than the version of EMDS (4.11) used in the 2004 MP inventory.

- *Revised Airport Activity Data and Seasonal Splits* – More robust records of aircraft activity data by aircraft type and season were obtained compared to those available for the 2004 MP inventory. The revised mix of aircraft reflected higher fractions of lower-emitting aircraft than in the 2004 MP inventory.

The net impact in airport (aircraft and GSE) CO emissions compared to those levels in the 2004 MP was a reduction of about 30%.

Area

- *Home Heating* – Estimates of wood use in previous Fairbanks emission inventories were based on the number of commercial and personal use wood cutting permits issued by the Alaska Division of Forestry. A telephone survey of 300 households in 2006, however, found the amount of wood burned during the winter of 2005 was 3.3 times greater than the winter of 2002 estimate that was based on Division of Forestry permits. The increase in wood use was confirmed in similar telephone survey conducted in 2007. The result of this finding is that estimates of CO levels from wood burning more than tripled between the 2004 and current MP.

Point

- *Facility Operating Information* – The approach used in both MPs was to estimate base year emissions using the most current source of activity data and to increase levels over time in proportion to population growth. For the 2004 MP, ADEC used operating information from 1995 to 2000 to estimate point source CO emissions; operating information from 2002 was used by ADEC in the current MP. The result of using the more current information was to reduce CO levels by roughly 30% in 2005 and later years relative to the previous MP.

Summary

A summary of the emission changes described above is presented in Table 1. It provides comparisons for each of the source categories in 2005, 2010, and 2015. Adjustments for additional control measures included in each MP are also presented so that the final inventory values can be contrasted. It shows that emission estimates for all of the source categories changed between the two inventories. As described above, the changes are the result of new insights from surveys, updated activity forecasts and model revisions. Collectively, they produced a 6% reduction in the 2005 estimate of CO emissions in the current MP relative to the 2004 MP, and a 7% increase in the forecasts of 2015 emissions. Overall, this depressed the reduction in CO forecast between 2005 and 2015 from 26% in the 2004 MP to 15% in the current MP.

If you have any questions about the information presented above, please do not hesitate to contact one of us.

Table 1
Comparison of Source Category Emissions
Between 2004 and Current CO Maintenance Plans
(tons/day)

Source Category	2004 Maintenance Plan			Current Maintenance Plan		
	2005	2010	2015	2005	2010	2015
On-Road	26.24	17.91	15.77	25.29	21.31	19.18
Nonroad	3.75	3.96	4.18	3.04	3.40	3.62
Area	1.10	1.10	1.10	2.89	3.09	3.23
Point	4.46	4.61	4.77	3.08	3.29	3.44
Total	35.54	27.57	25.82	34.31	31.09	29.47
Additional Controls	1.73	0.98	0.73	2.62	2.53	2.61
Total	33.81	26.59	25.09	31.69	28.56	26.87

Memorandum
Fairbanks Carbon Monoxide Maintenance Plan
Emission Inventory Control Measure Adjustments
October 25, 2007

October 25, 2007

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Memo to: Alice Edwards, ADEC

From: Bob Dulla and Frank Di Genova

Subject: Fairbanks Carbon Monoxide Maintenance Plan Emission Inventory Control Measure Adjustments

This memorandum documents control measure benefits presented in Table III.C.3-2 entitled "Adjusted Fairbanks CO Emissions Inventory: Nonattainment Area Totals" in the subject Plan. Presented below are the assumptions and calculations used to produce the control measure reductions listed in that table.

Wood Burning Ban

In October 2003, the FNSB Assembly adopted an ordinance that implemented an episodic woodstove burning ban as a CO control measure. Under this measure, a woodstove burning ban will be implemented whenever the Borough declares an air quality alert. An alert is called whenever the Borough determines that the ambient CO standard is likely to be exceeded. Residences that rely on woodstoves as their sole source of heat are exempted from compliance. Insight into the percentage of homes that could be exempted was obtained in a recent home heating survey. That survey, conducted in 2007, showed that out of 300 respondents, only 7 claimed to heat their homes exclusively with wood burning. All of these respondents, however, indicated that they had other sources of home heat (they just chose not to use them). Given the Borough's commitment to strictly enforce this measure on an episodic basis and the de minimus number of homes that could be exempted from compliance (i.e., 2.3% according to the survey), it was conservatively assumed that this measure would have a rule effectiveness of 90%. This is the same method used to quantify CO reductions for this measure in the 2004 Maintenance Plan, which EPA approved.

Oxygen Sensor Replacement

Based on data provided by Fairbanks North Star Borough staff, the annual numbers of oxygen sensors replaced in each of the first three years of the program, and the cumulative totals replaced to date, are as shown in Table 1.[*]

[*] Data on annual replacements, July 1 to July 1, were provided by FNSB staff. The number of sensors installed in 2006–2007 is a projection by Sierra based on a reported number of 629 sensors replaced through March 31, 2007, prorated from 9 to 12 months.

Table 1 **Annual and Cumulative Total Numbers of Sensors Replaced through FNSB's Oxygen Sensor Replacement Program**		
Program Year	No. Replaced Each Year	Cumulative No. Replaced
Year 1 (2004–2005)	468	468
Year 2 (2005–2006)	1,336	1,804
Year 3 (2006–2007)	839	2643

The nearly three-fold increase in the number of sensors replaced in the second year of the program compared to the first year was likely due to an increase in shop reimbursements that was instituted by the Borough, while the reduction from years 2 to 3 may be due to the declining number of candidate vehicles.[*] Originally, Sierra recommended a program that targeted sensor replacement in 6,720 vehicles and, based on vehicle measurements before and after sensor change, projected a reduction of 1.77 tons of CO per average winter day. However, as the data above show, voluntary participation, while significant, has not reached those targets.

To provide a more precise but conservative estimate of wintertime emission benefits year-by-year, we first assume that one-half of the sensors installed each year are in place during the respective winters, as shown in the first two columns of Table 2. As reflected in the third column of the table, this analysis makes no assumption regarding continuation of the program beyond July 2007, i.e., we assume here that the number of sensors installed beyond that date is zero and that the cumulative numbers of sensors replaced is unchanged in each year after 2007–2008.

Deterioration of replacement oxygen sensors is expected over time, but no data have been collected in Fairbanks to evaluate that effect. For purposes of this analysis, we assume that each replaced sensor deteriorates linearly by 25% per year,[†] which is reflected in column 4 of Table 2 as the number of sensors adjusted for deterioration. The last column shows the CO emission reduction benefits of the adjusted numbers of sensors using the original calculation that 6,720 sensor replacements yields 1.77 tons of CO reduced per winter day. The calculated CO emission reductions from years 2005 through 2010 are likewise shown in the most recent version of the State Implementation Plan.[‡]

[*] Prior to the start of the program, we estimated that the average remaining life of the repaired vehicles, based on model years, was about 4.5 years.
[†] Each hypothetical sensor that reduces emissions by 1 lb/winter-day when installed is assumed to reduce emissions by 0.75, 0.5, 0.25, and 0 lbs/winter-day in each of the next four respective years.
[‡] See Table III.C.3-2, page III.C.3-5 of Alaska's (draft) Amendments to the State Air Quality Plan.

Table 2 Updated Estimate of Annual Wintertime CO Reductions from FNSB Oxygen Sensor Replacement Program				
Winter Year	Cumulative Total No. of Sensors Replaced	Annual Number of Sensors Installed	Annual Number of Sensors Adjusted for Deterioration	CO Reduction (tons per average winter day)
2004-05	234	234	234	0.06
2005-06	1,136	902	1,078	0.28
2006-07	2,224	1,088	1,881	0.50
2007-08	2,643	420	1,745	0.46
2008-09	2,643	0	1,084	0.29
2009-10	2,643	0	482	0.13
2010-11	2,643	0	105	0.03
2011-12	2,643	0	0	0.0

HDGV OBD-I/M

Estimates of OBD benefits for heavy-duty gasoline vehicles (HDGVs) were estimated outside of AKMOBILE6 since MOBILE6 does not calculate I/M benefits for heavy-duty gasoline vehicles. The approach used was to quantify base emissions for the heavy-duty gasoline vehicles that would be subject to OBD (i.e., Class 2B – 4 or 8,500 – 14,000 lbs). Since no idle emission rates are available for these vehicles, the estimates were based on MOBILE6 values. The results indicated that these vehicles are responsible for roughly 0.5 tons/day of CO emissions during the winter in Fairbanks. Benefits of OBD were estimated using MOBILE6 estimates of light-duty vehicles subject to a TSI (two-speed idle) I/M Program and an OBD I/M Program. The incremental reduction was found to be 4%. This reduction was applied to the base CO levels for HDGVs subject to OBD. This produced a reduction of 0.02 tons/day. This value was then reduced to account for (a) the 1996+ vehicle share of the HDGV fleet class subject to the program and (b) vehicles being tested once every two years in a biennial I/M program. These reductions produced a rounded value of 0.01 tons per day. In an effort to be conservative, the reductions were assumed to remain the same between 2006 and 2009. A similar methodology was used to quantify the benefits of HDGV OBD in the 2004 Maintenance Plan that was approved by EPA.

Other

The 2004 Maintenance Plan claimed a 0.03 ton/day credit for “other” measures, which was based on the increased ridership associated with free winter transit fares and the retrofit of parking spaces with electrical outlets for plug-in use. Funding for the free winter transit service, however, is no longer available. While the Borough has agreed to partially fund the program out of the general fund, ridership is thought to have diminished relative to when the winter service was completely free. For that reason, transit service enhancements alone cannot be used to support the CO reduction claimed for “other” control measure category. Working with ADEC, Fairbanks continues, however, to fund a public awareness program that highlights a range of CO reduction measures, including plugging-in, use of transit, wood stove maintenance, and I/M program participation. The benefits of the program were estimated to be in the range of 0.34–0.68 tons of CO per day during the winter of 2001–2002.[*] In light of the substantial benefits claimed, and the fact that ADEC and FNSB continue to fund public awareness ads, it was determined that continuation of the 0.03 ton per day credit for “other” measures was a conservative estimate of the reductions accruing to improved transit service, continued public awareness, and unclaimed credits for other control measures, including increased availability of spaces equipped with electrical outlets for plug-ins, etc.

If you have any questions about the estimates outlined above, please do not hesitate to contact either of us for additional information.

[*] Email correspondence to Alice Edwards from Bob Dulla, February 24, 2003, “Take Action Against Air Pollution, A Public Information Campaign in Fairbanks, Report on Project Accomplishments”

Alaska Department of Environmental Conservation

Amendments to:

State Air Quality Control Plan

Vol. III: Appendices

Appendix III.C.6

Adopted
April 4, 2008

Memorandum
Selection of CO Design Values for Fairbanks Maintenance Plan
January 27, 2004

January 27, 2004

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Memo To: Mahbubul Islam, U.S. EPA Region 10
Alice Edwards, Alaska Department of Environmental Conservation

From: Bob Dulla

Subject: Selection of CO Design Values for Fairbanks Maintenance Plan

At a meeting in May of last year, representatives of Anchorage, Fairbanks, the Alaska Department of Environmental Conservation (ADEC), and EPA Region 10 staff agreed that regional dispersion models lack the sophistication required to accurately represent the influence of Alaska's extreme meteorological conditions on ambient carbon monoxide (CO) concentrations. As a result, it was agreed that a combination of probabilistic rollback and box modeling would be used to demonstrate attainment in upcoming Maintenance Plans. Presented below is a statistical analysis of ambient CO concentrations and related meteorological data recorded in Fairbanks between 1990 and 2002. The results define a range of design values representing different probabilities of occurrence.

Summary

Several statistical methods were used to examine calendar year trends in design values under alternate confidence intervals. The first was a simple linear regression of 2nd-high 8-hour CO concentrations recorded at the Hunter School, Post Office, and State Building monitors. Alternate upper bound (i.e., 1-sided) confidence levels above the best fit trend in 2nd-high values were computed separately for each monitoring site. The values computed for 2002 (the last year of complete monitoring data) represent design values with a specific probability of occurrence for rollback modeling.

Not surprisingly, linear regression proved to be a poor predictor of annual trends in monitor-specific values in Fairbanks (r^2 values ranged between 0.2 and 0.4). The weather-induced annual variation in 2nd-high values combined with the steep drop off in recent years provide a noisy nonlinear trend that is beyond the scope of linear regression. There is also concern that this type of analysis offers no insight into the causal factors underlying ambient CO concentrations and little assurance that the factors affecting concentrations recorded in recent years have been adequately accounted for in establishing a design value.

To fill this void, an alternate statistical analysis was conducted. It uses data on 8-hour average CO concentrations and corresponding meteorological conditions compiled over a

9-year period to develop a physical model of ambient CO concentrations in winter months. The model is calibrated to predict the 2nd-high CO concentrations that have occurred at the three monitoring stations in Fairbanks. The calibrated model is then used in a Monte Carlo simulation to estimate CO design values pertaining to calendar year 2002.

The simulation process constructs hypothetical winter periods that are representative of the full range of weather conditions that have occurred over the 9-year period. The physical model is used to estimate the 2nd-high CO value that would be expected in each simulated year, assuming a CO inventory equal to that for calendar year 2002. The empirical distribution of 2nd-high CO values produces a design curve from which CO values having a specified probability of occurrence can be selected.

Table 1 summarizes CO design values for Fairbanks under a range of assumptions for the probability of occurrence. As can be seen, all of the design values are above the 9 ppm standard—when used in a rollback calculation, they would establish attainment targets that require additional emission reductions.

Table 1
CO Design Values for Fairbanks
(As of Calendar Year 2002)

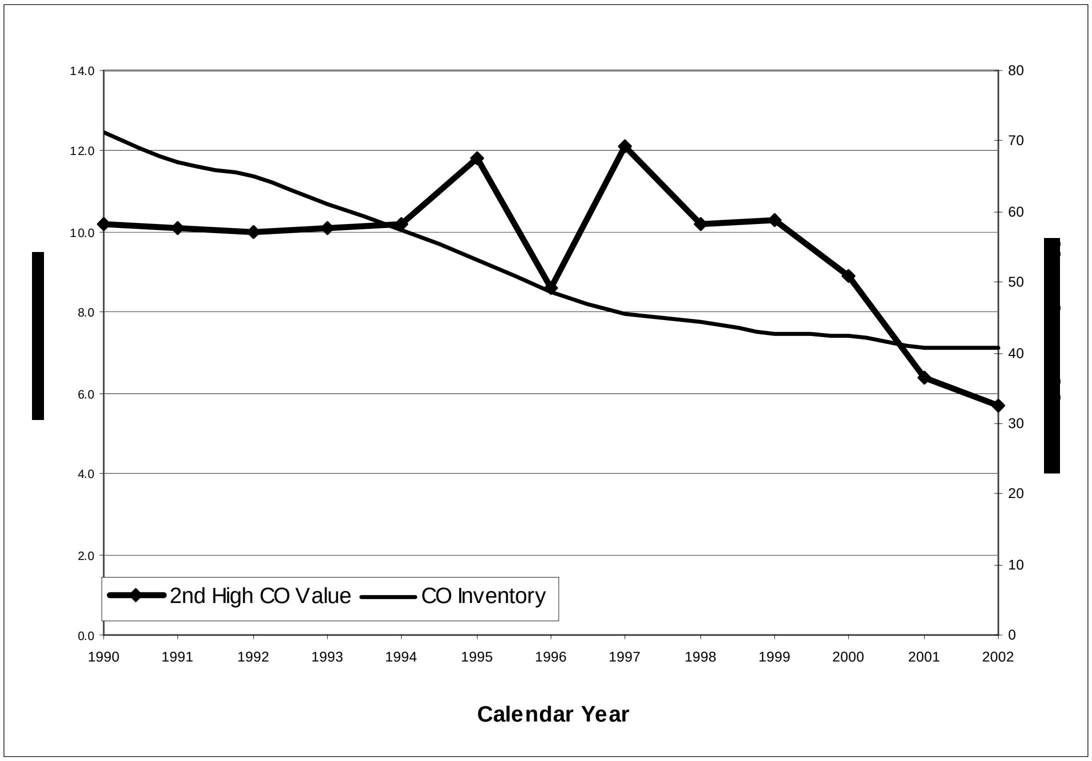
Confidence Interval (1-sided)	CO (ppm)	Probability of Occurrence
80 percent	9.72	1 year in 5
90 percent	10.50	1 year in 10
93.3 percent	10.84	1 year in 15
95 percent	11.09	1 year in 20

Background

Over the past 12 years, Fairbanks has experienced a 43 percent decline in its CO inventory, from 71.1 tons per day (winter average) in 1990 to 40.6 tons per day in 2002. During the same time, as seen in Figure 1, there has been only a modest decline in the 2nd-high CO concentrations[1] actually observed. Until the year 2000, CO concentrations varied from 8 to 12 ppm with little indication of a downward trend in response to the declining CO inventory. Only since 2000 have CO values fallen below 8 ppm. However, it is difficult to generalize from such observations, since weather conditions exert a large influence on CO and have varied significantly from year to year.

[1] CO values shown in the figure are the largest value among the 2nd-high 8-hour average CO recorded at the three monitoring stations in each calendar year. All CO concentrations and meteorological conditions used in this analysis are 8-hour averages.

Figure 1
Trend in Ambient CO Concentrations and Emission Inventory Estimates for Fairbanks (1990-2002)



The first examination of the data used linear regression analysis of the 2nd-high 8-hour CO concentrations recorded at each of the monitoring sites to establish a best fit trend line and upper bound prediction interval. The analysis focused on the upper bound intervals (since lower bound values are not relevant to the selection of design values).[2] A summary of the results is presented in Table 2 for each of the three monitoring sites. Upper bound values are presented for 95, 90, 85 and 80 percent confidence intervals.

The 2002 upper bound values define potential design values. All of Post Office values are well above the 8-hour standard of 9 ppm. The values for Hunter School and the State Building are lower, but well above the standard at the 90 and 95 percent confidence levels. The problem with all of the values, however, is that they are derived from regressions that poorly represent the trends in the data (the r^2 values range between 0.2 and 0.4).

[2] For example, a two-sided 95 percent confidence interval would establish both an upper- and lower-bound CO value. The upper-bound value would be exceeded only 2.5% of the time (i.e., equivalent to a 97.5 percent upper-bound confidence interval).

Table 2
Confidence Limits for 2nd-High Values Recorded at Fairbanks Monitoring Sites

Hunter CO, ppm						
		Predicted from	Upper Interval Value			
Year	Measured 2nd High	Regression Equation	95%	90%	85%	80%
1991	10.1	10.92	14.45	13.79	13.39	13.09
1992	10.0	10.56	14.00	13.36	12.97	12.68
1993	9.0	10.21	13.56	12.94	12.56	12.27
1994	9.8	9.85	13.15	12.53	12.16	11.88
1995	11.6	9.50	12.75	12.15	11.78	11.50
1996	8.6	9.14	12.38	11.77	11.41	11.14
1997	10.6	8.79	12.02	11.42	11.05	10.78
1998	8.7	8.43	11.69	11.08	10.71	10.44
1999	9.8	8.08	11.38	10.76	10.39	10.11
2000	8.3	7.73	11.08	10.46	10.07	9.79
2001	5.4	7.37	10.81	10.17	9.78	9.49
2002	5.7	7.02	***10.55***	***9.89***	***9.49***	***9.19***
Regression Equation y = 11.98 - 0.355x R^2 = 0.481						

Post Office CO, ppm						
		Predicted from	Upper Interval Value			
Year	Measured 2nd High	Regression Equation	95%	90%	85%	80%
1991	9.1	10.83	15.57	14.69	14.15	13.75
1995	11.8	9.71	14.08	13.27	12.77	12.40
1996	8.6	9.43	13.77	12.96	12.47	12.11
1997	12.1	9.15	13.49	12.68	12.19	11.83
1998	10.2	8.87	13.24	12.43	11.93	11.56
1999	10.3	8.59	13.02	12.19	11.69	11.32
2000	8.9	8.31	12.82	11.98	11.47	11.09
2001	5.5	8.03	12.64	11.78	11.26	10.87
2002	5.6	7.75	***12.49***	***11.61***	***11.07***	***10.67***
Regression Equation y = 11.579 - 0.373x R^2 = 0.470						

State Building CO, ppm						
		Predicted from	Upper Interval Value			
Year	Measured 2nd High	Regression Equation	95%	90%	85%	80%
1991	9.5	10.46	14.26	13.55	13.12	12.80
1992	9.1	10.09	13.78	13.09	12.67	12.36
1993	9.6	9.71	13.32	12.65	12.24	11.94
1994	8.5	9.34	12.88	12.22	11.82	11.52
1995	10.6	8.97	12.47	11.81	11.42	11.12
1996	8.4	8.59	12.07	11.42	11.03	10.74
1997	10.8	8.22	11.70	11.05	10.65	10.36
1998	8.0	7.85	11.35	10.69	10.30	10.00
1999	8.9	7.48	11.02	10.36	9.95	9.66
2000	8.2	7.10	10.71	10.04	9.63	9.32
2001	4.7	6.73	10.42	9.73	9.31	9.00
2002	4.6	6.36	***10.15***	***9.45***	***9.01***	***8.69***
Regression Equation y = 11.672 - 0.280x R^2 = 0.243						

An improvement to this approach can be made by adjusting the 2nd-high CO concentrations observed each year for changes in the CO inventory. For example, an observed CO value of 10.0 ppm in 1992 would be adjusted downward by the ratio of inventory changes from 1992 to 2002 to yield an adjusted value of 6.25 ppm:

10.0 * (65.09 tons/day in 1992 / 40.69 tons/day in 2002) = 6.25 ppm

The adjusted value is the CO concentration one would expect in 2002 if the conditions that produced the 10.0 ppm peak in 1992 were to recur. The adjustment method assumes that ambient CO levels are proportional to the CO inventory in the same manner that the rollback method assumes. The proportionality assumption is also supported by the analysis conducted to develop a physical model for CO concentrations, as reported below.

When the Fairbanks data are adjusted for inventory changes, one finds that the adjusted 2nd-high CO concentrations range from 6 to 11 ppm without evidence of a systematic trend over time (see Figure 2). The CO values average 7.62 ppm (lower solid line in figure) with a standard deviation of 1.69 ppm. One-sided confidence intervals are the appropriate measures of upper bounds in CO, since only high values are of regulatory concern. The one-sided 90 percent confidence interval is 10.6 ppm (upper dashed line in figure) and is the value that one would expect to exceed with a frequency of 1 year in 10. The 10.6 upper bound is exceeded only in 1997, or only one time in the 13 years observed, consistent with its estimated probability of occurrence. A similar analysis for each of the monitoring stations in Fairbanks is reported in Table 3.

Figure 2
Trend in Inventory-Adjusted Ambient CO Concentrations for Fairbanks (1990-2002)

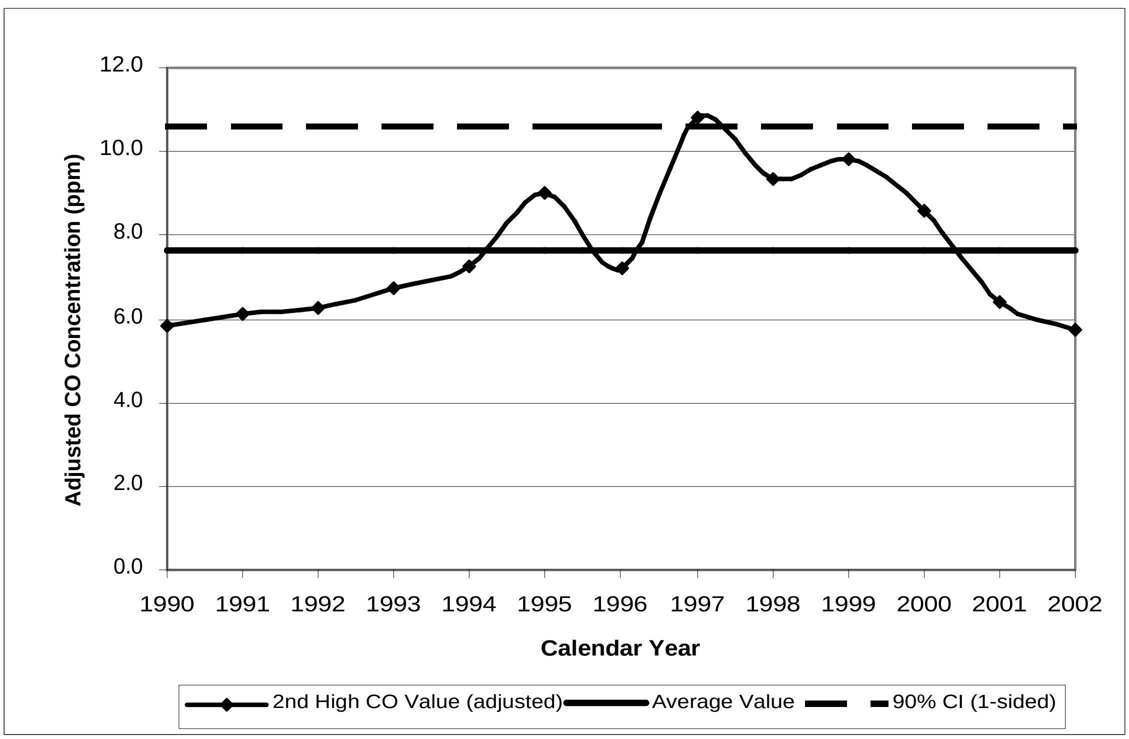


Table 3
Probabilistic Assessment of Inventory-Adjusted CO Concentrations (As of Calendar Year 2002)

	Hunter	Post Office	State Bldg	Fairbanks[a]
Mean CO (ppm)	7.2	7.5	6.8	7.6
Std CO (ppm)	1.47	1.80	1.46	1.69
Probabilistic Upper Bound (ppm)				
80% CI (one-sided)	9.2	10.0	8.8	9.9
90% CI (one-sided)	9.9	10.7	9.4	10.6
95% CI (one-sided)	10.4	11.4	10.0	11.3

[a] Highest CO value recorded at any monitor in each year.

Such analyses provide useful background information on the likely magnitude of CO design values. Their limitation is related to the small number of data points that are used (13 in this instance). Reliable results could be obtained if the days on which the 2nd-high peaks are observed prove to be a representative sample of the conditions under which such peaks will occur in the future. The CO values will be overstated, however, if the small sample happens to be disproportionately weighted toward extreme conditions, and they will be understated if the sample is weighted toward milder conditions. Simple trend analyses of this kind are of unknown reliability as long as the probability of occurrence for the underlying causal factors remains uncontrolled.

Methodology

Rollback modeling is a simple calculation that assumes the percent reduction needed to reduce design values to the level of the ambient standard dictates the percent reduction in emissions needed to demonstrate attainment of that standard. The calculation implicitly assumes that all emissions produced within the modeling domain have an equal impact on attainment. It also assumes that the meteorology producing the specified design value is the worst meteorology the modeling domain will experience in future years.

The weakness of the first assumption is that all pollutant sources do not have an equal impact on concentrations recorded at monitors or encountered within the modeling domain. For example, power plants with high stack heights in Fairbanks are very likely emitting pollutants above the low-level inversion layer that traps emissions from lower level sources (e.g., cars, truck, etc.). Thus, while they contribute to the inventory of CO emitted within the modeling domain, they have little or no impact on the concentrations recorded when low-level inversions are in place.

The weakness of the second assumption is that weather conditions are constantly changing, and it is not only possible—but also likely—that conditions seen in past years leading to high concentrations will appear again in the future. The problem is that EPA guidance has limited the selection of CO design values to the maximum 2nd-high non-overlapping 8-hour value recorded during the most recent two-year period. Given the variability in meteorology, it is unlikely that the weather conditions leading to a violation in the most recent 2-year period are indicative of the severity of conditions that will be experienced in future years.

Given dispersion models' limited ability to represent Alaska's meteorological conditions, probabilistic rollback was selected as the preferred method for determining the CO reductions needed to demonstrate attainment. The principal benefit of probabilistic rollback modeling is that it provides a framework to rigorously consider conditions that produced historic violations of the ambient CO standard and to project their effect on the emission reductions needed to demonstrate attainment in future years. Thus, instead of selecting the conditions from a single day in a recent two-year period to determine the reductions needed for attainment, it is possible to consider the range of conditions that occurred during a longer period of time (almost a decade), estimate the probability of their occurrence, and evaluate their effect on the reductions needed for attainment.

As shown above, simple trend analysis is a poor predictor of site-specific design values and provides no insight into the underlying causes of the variation in CO concentrations. For this reason, a Monte Carlo simulation was used to quantify the probability of occurrence of ambient CO concentrations in the future as a function of CO inventories and meteorological conditions.

Monte Carlo simulation is a widely used method for assessing the expected outcome of a stochastic (probabilistic) process, and it is particularly useful in circumstances where a large number of factors act, and interact, to produce the outcome. In Fairbanks, ambient CO concentrations are the result of a stochastic process in which meteorological conditions that support trapping of CO combine with increased levels of CO generation to produce elevated CO readings at a monitor. In one instance, a given level of CO may occur because meteorological conditions that cause *partial* trapping coincide with unusually high rates of CO generation. In another instance, the same CO level may occur because *stronger* trapping conditions may coincide with a lower rate of CO generation. Thus, there is a significant and complex interplay of the factors leading to elevated CO concentrations. The overall probability that a given CO level will occur is the joint probability of occurrence for all of the causal factors that lead to the given level.

Monte Carlo simulation combines a representation of the physical (causal) relationships that connect input variables to the output variable(s) of the process with the assessment of the probability distribution for each of the inputs. A simulation is conducted by choosing at random a complete set of inputs from the probability distributions of the input variables. The physical relationships are used to estimate the expected outcome of the process for the chosen set of variables. Uncertainty in the outcome, as can result from unexplained variation not related to the known causal variables, is then added to the expected value to generate one possible outcome of the process. The simulation process is then repeated many times to generate the range of outcomes possible for the process, in which each individual outcome appears in proportion to its overall probability of occurrence.

A distinguishing feature of Monte Carlo simulation is that it estimates the probability of occurrence for each potential outcome. Thus, its application to the problem of CO concentrations in Fairbanks leads to more than a point estimate of the CO Design Value—it leads to a cumulative probability curve that gives the chance that the 2nd-high CO concentration recorded in Fairbanks will exceed a particular value in any one year. From this curve one can choose a specific CO Design Value that has an appropriate probability of occurrence. Other strengths of Monte Carlo simulation are the following:

- It permits assessment of the joint probability of occurrence for multiple factors in a manner that is straightforward to implement, without the need to invoke formulas of statistics and probability that may be hard to apply in a complex problem.

- It makes explicit the assumptions used in the analysis and permits controlling the probability of occurrence for the causal factors to the levels thought to best represent future conditions. One is *never* faced with accepting an implicit, unrepresentative assumption, as can happen in rollback analysis based on the most recent two-year period.

As described in the following sections, several steps were required to implement a Monte Carlo simulation of CO concentrations in Fairbanks. First, a model was developed to relate selected physical variables to ambient 8-hour CO concentrations recorded in Fairbanks. Because the meteorological variables were measured at a single site (not at each monitor), the output variable predicted by the model was chosen to be the highest (8-hour average) CO value recorded for each hour at the three monitoring stations in Fairbanks. Nine years of data covering the period from 1992 to 2002[3] were used. The input variables chosen to explain CO concentrations were measures of CO generation rates and the strength of atmospheric trapping that permits CO concentrations to build up over the 8-hour averaging period. Factors influencing CO generation rates included the CO inventory, ambient temperatures as they affect CO emissions from automobiles, home heating, etc., and the average activity level (e.g., traffic flows) for each hourly period in question. Factors influencing atmospheric trapping included temperature lapse rates above the ground level and local wind speeds.

The coefficients of the physical model were estimated using conventional regression analysis applied to data recorded for selected hourly periods in the winter months that were most representative of the periods when high CO concentrations have occurred. The selected periods were ones with above-average CO concentrations, a low-level temperature inversion in place, and between the hours of 4 pm and 3 am when all of Fairbanks' CO peaks have been recorded. While giving satisfactory predictions for the bulk of the winter period, the model was found to underpredict CO concentrations during the most extreme conditions in which the highest CO values are recorded. Therefore, the

[3] Calendar years 1998 and 1999, and the months January and February 2000, are excluded from the analysis due to the unavailability of meteorological data.

model was calibrated against data for the highest CO peaks to give unbiased predictions of the highest hourly CO concentrations that occur in Fairbanks.

The physical model was then used in a Monte Carlo simulation of peak period CO concentrations for calendar year 2002, based on the meteorological patterns occurring over the nine-year period (January 1992 through February 2000) and the CO inventory for 2002. In each trial of the simulation process, weather conditions for each day and hour of a hypothetical winter were selected randomly from the weather conditions occurring during the nine-year period. The physical model was then evaluated for the weather conditions and activity levels in each hourly period, and an allowance made for the random variation around the prediction, to estimate the 8-hour CO concentration for the hour.

Having simulated each hour during a winter period, the hourly data were sorted in decreasing order of CO concentrations, EPA criteria were applied to determine when the 2nd-highest, non-overlapping peak CO reading occurred, and the resulting 2nd-high CO value was saved. A total of N=1,000 complete winter periods were simulated, and the 2nd-high CO values for the simulated winters were combined to map out the cumulative probability curve for 2nd-high CO readings in Fairbanks, displayed in Figure 8 at the end of the report. Because it is based on long-term weather patterns actually experienced in Fairbanks, this curve gives a more reliable estimate of CO Design Values than can any method based on recent trends. The following sections present the development of this curve, beginning with the physical model of ambient CO concentrations.

Physical Model of Ambient CO Concentrations

Given the importance of the issue, an effort has been made to identify and assess the causal factors that are associated with elevated ambient CO concentrations. The resulting physical model is intended to support predictions of CO concentrations as a function of meteorological and other factors.

The data underlying the analysis consist of 8-hour average observations of the CO concentrations at three monitoring stations (Hunter, Post Office, and State Bldg) and of the meteorological conditions measured at one location in downtown Fairbanks, including:

- Date and ending hour for each 8-hour rolling period;
- 8-hour average CO concentration (ppm);
- 8-hour average ambient air temperatures (Fahrenheit) measured at 10, 33, and 75 ft heights; and
- 8-hour average wind speed (mph).

The largest 8-hour CO value among those recorded at the three monitors is chosen as the dependent variable. The use of 8-hour averages loses information related to the dynamic variation of CO concentrations and weather conditions within the averaging period, but is an unavoidable simplification at this early stage in the analysis.

The data are available for 4 winter months (November through February) during the period January 1992 through December 1997 and November 2000 through December 2002. The meteorological data do not exist for calendar years 1998 and 1999, or for January and February 2000. As a result, all data for these periods were excluded from analysis.

There are no direct measures of CO-generating activity levels available for these time periods. Some information, such as traffic counts, exists in other databases, but these have not been merged with the CO and meteorological data. The CO inventory, specified annually and estimated for the average winter day, has been merged with the data as an indirect measure of CO generation rates.

The hourly periods of greatest interest are those in which high CO concentrations have been recorded. The following criteria were used to select such periods:

- CO concentrations in excess of a threshold of 5.5 ppm in 2002, adjusted for changes in the CO inventory each year.
- Hours between 1600 (4 pm) and 0300 (3 am), inclusive, which constitute the 12-hour period in which all of Fairbanks' 2nd-high peaks have been recorded.
- L1033 (temperature differential between 10 and 33 feet) greater than zero, indicating the presence of a low-level temperature inversion and the capacity for atmospheric trapping.

There are 504 such hourly periods, or 4.3 percent of the 11,700 rolling 8-hour periods observed in the 4 winter months of the 9-year span of the data.

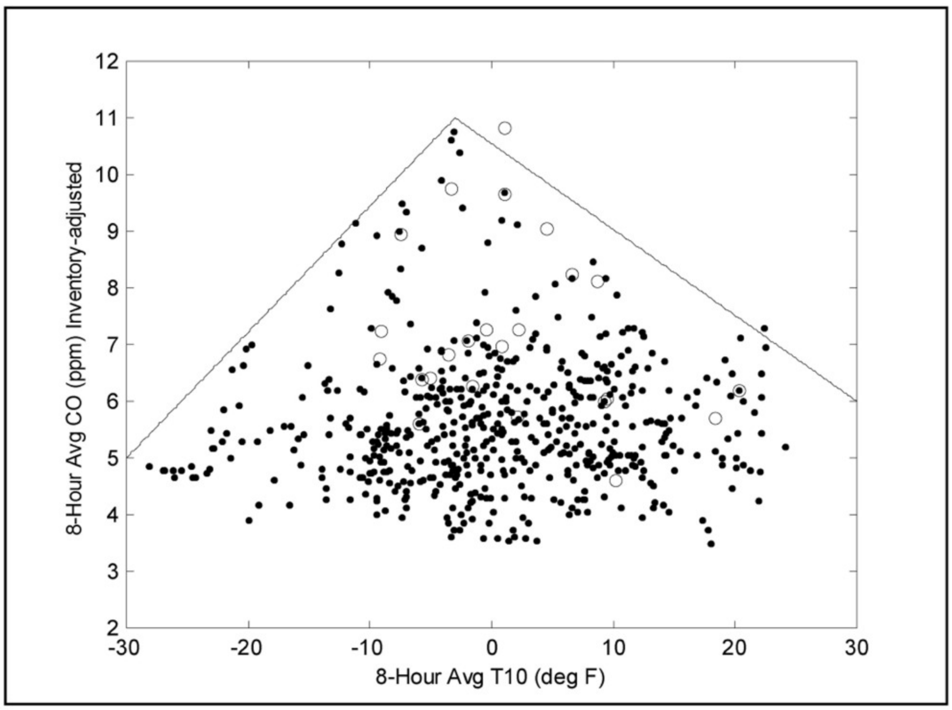
The premise of the physical model is that ambient 8-hour average CO concentrations should be a function of:

- CO inventory, as a measure of CO generation rates;
- Activity levels specific to each 8-hour averaging period;
- Ambient temperatures as they affect CO generation in cold weather;
- Presence of a temperature inversion and the strength of the resulting atmospheric trapping; and
- Wind speed, as a factor tending to disperse CO.

Some of the factors, such as the specific activity levels, cannot be directly measured with existing data, while the meteorological factors may involve complex relationships with CO.

Exploratory data analysis revealed that 2nd-high CO values, adjusted for inventory changes to 2002, are distributed in a triangular fashion with respect to temperature T10, as shown in Figure 3. Points in the figure are the values observed for the 504 hourly periods, while the open circles are the values observed at the hours when 2nd-high CO peaks were recorded at individual monitoring stations. The greatest CO values are recorded at temperatures somewhat below 0 degrees Fahrenheit. The CO falloff as temperatures increase, indicated schematically by the boundary line on the right, is interpreted as the effect of reduced CO generation rates from automobiles, space heaters, and other temperature-sensitive sources. The CO falloff as temperatures decrease, indicated by the boundary line on the left, is interpreted as the result of the increased dispersion potential associated with ice fog produced at colder temperatures.

Figure 3
Relationship of Inventory-Adjusted CO Concentrations to Ambient Temperature



This complex relationship was modeled using two independent temperature terms, which are the regression counterparts of the boundary lines seen in the figure:

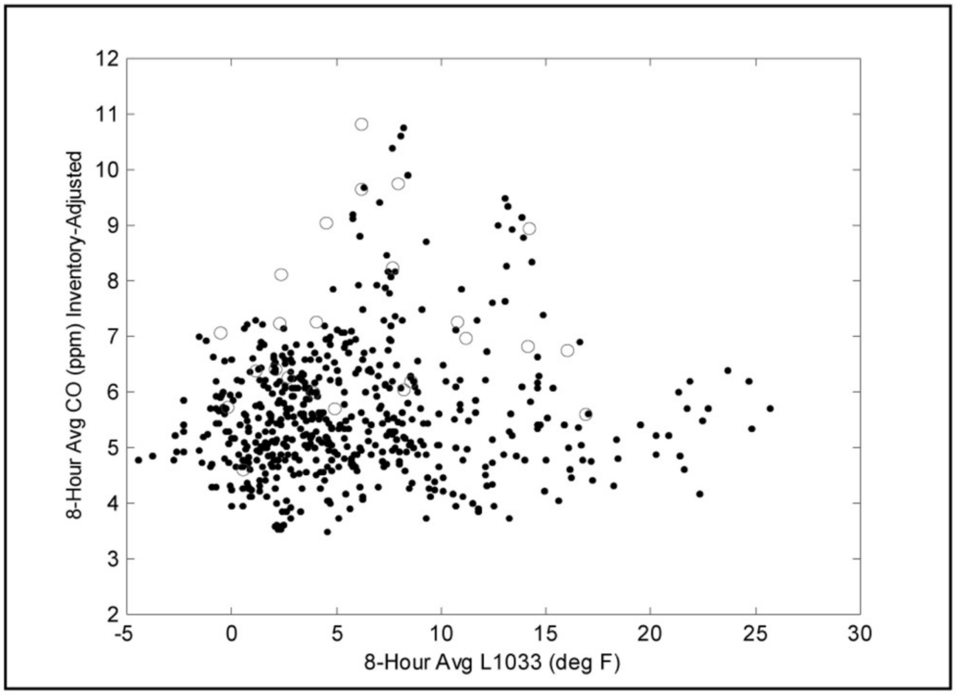
- A variable LoT10R representing the ice fog effect. This term is a maximum for temperatures at or above a reference temperature T_0, and falls linearly with temperature at lower temperature.
- A variable HiT10R representing the temperature sensitivity of CO generation rates. This term is a maximum for temperatures at or below a reference temperature T_0 and falls linearly with temperature at higher temperatures.

The terms are stated as Rankin temperatures[4] to permit taking logarithms in the regression.

It is expected that CO concentrations will increase with increasing strength of the temperature inversion, all other factors being constant. In an atmosphere in thermal equilibrium, temperature will decrease at the adiabatic rate of 5.4 deg F per 1000 feet of altitude. Mixing of the atmosphere is impeded when temperatures cool less rapidly than adiabatic or, particularly, when temperatures increase with altitude. In Fairbanks, cold ground temperatures cause rapid cooling of the lower air layers in the hours immediately after sundown and lead to frequent wintertime temperature inversions that trap CO emissions near the ground.

Several ways of measuring the strength of a temperature inversion were considered, including temperature differences between the heights of 10 and 33 feet and between 33 and 75 feet, and the thickness of the inversion layer implied by the measured temperatures. The data are consistent with the physical expectation that trapping at/near the ground layer is most important for CO buildup. While L1033 (temperature difference between 10 and 33 feet) proved to be the best available measure of inversion strength, there is a considerable spread in CO concentrations, as shown in Figure 4. Although there is a general tendency for CO values to increase with increasing L1033, large

Figure 4
Relationship of Inventory-Adjusted CO Concentrations to Atmospheric Trapping



[4] The absolute temperature scale for the Fahrenheit system. Zero degrees Fahrenheit is 460 degrees Rankin. An increase of 1 deg R is equivalent to an increase of 1 deg F.

differentials can exist with only modest CO concentrations. A better measure of the strength of atmospheric trapping could significantly improve the predictive power of the physical model.

Wind speed should be inversely associated with CO concentrations because high winds promote mixing of the atmosphere and dispersal of pollutants. Wind speeds are generally light (less than 3 mph) during the peak hourly periods considered here, and fall below 2 mph when the highest CO values are recorded. No figure is provided to illustrate the effect because it is relatively modest.

A log-log formulation was selected for the physical model after initial tests demonstrated it gave a better fit than linear forms; the log-log formulation is not uncommon when working with physical data that cannot take on negative values. In this formulation, the regression coefficients are interpreted as elasticities or sensitivity parameters. In addition to terms for meteorological conditions, an annual inventory adjustment term was included in the model to represent the year-to-year changes in CO generation rates. Hour-specific dummy variables also were included to represent diurnal trends in activity levels and CO buildup/dispersal during the late afternoon through early morning hours, as observed on average over the 9-year period of the data.

The functional form of the physical model is:

$$
\begin{aligned}
CO(yr,hr,T10,T33,WSp) = \; & CO_0 \\
& * \; (Inventory_{yr}/Inventory_{2002})^A \\
& * \; \exp(B_{hr}) \\
& * \; (LoT10R/453)^C \\
& * \; (HiT10R/453)^D \\
& * \; L1033^E \\
& * \; WSp^F
\end{aligned}
\qquad (1)
$$

where:

the intercept term corresponds to the activity level of the 1600 hour and zero-point [log(1)] values for the other variables;

$\exp(B_{hr})$ are hour-specific adjustment factors for the hours 1700 through 0300;

the LoT10R and HiT10R terms are normalized to a reference temperature T_0 of -7 deg F (453 deg Rankin);

L1033 > 0 is required to permit taking logarithms; and

and WSp is wind speed in mph.

The reference temperature T_0 = -7 deg F for the LoT10R and HiT10R terms was estimated by iteratively adjusting an initial estimate until a maximum R^2 value was obtained. The physical model is summarized in Table 4.

Table 4
Physical Model of CO Concentrations

Dependent Variable = ln(8-hour average CO concentration)
Independent Variables = {CO inventory, time of day, ambient temperature, wind speed}
R^2 = 0.415

Term in Model		Coefficient	t-value	Definitions
	Intercept	1.983	56.32	
A	$\ln(Inv_{yr}/Inv_{2002})$	1.000	15.98	
C	ln(LoT10R/453)	4.369	4.11	LoT10R = 453 + (T10 - -7), T10 < -7 F = 453, otherwise
D	ln(HiT10R/453)	1.767	4.09	HiT10R = 453 - (T10 - -7), T10 > -7 F = 453, otherwise
E	ln(L1033)	0.030	3.83	T33 - T10, deg F
F	ln(Wind Speed)	-0.103	3.95	Wind Speed, mph
B_{17}	Hour 17	0.033	0.92	dummy variable (0,1)
B_{18}	Hour 18	0.019	0.57	dummy variable (0,1)
B_{19}	Hour 19	-0.001	0.03	dummy variable (0,1)
B_{20}	Hour 20	-0.018	0.53	dummy variable (0,1)
B_{21}	Hour 21	-0.029	0.85	dummy variable (0,1)
B_{22}	Hour 22	-0.046	1.32	dummy variable (0,1)
B_{23}	Hour 23	-0.082	2.26	dummy variable (0,1)
B_{00}	Hour 00	-0.086	2.11	dummy variable (0,1)
B_{01}	Hour 01	-0.107	2.38	dummy variable (0,1)
B_{02}	Hour 02	-0.169	3.51	dummy variable (0,1)
B_{03}	Hour 03	-0.187	2.96	dummy variable (0,1)

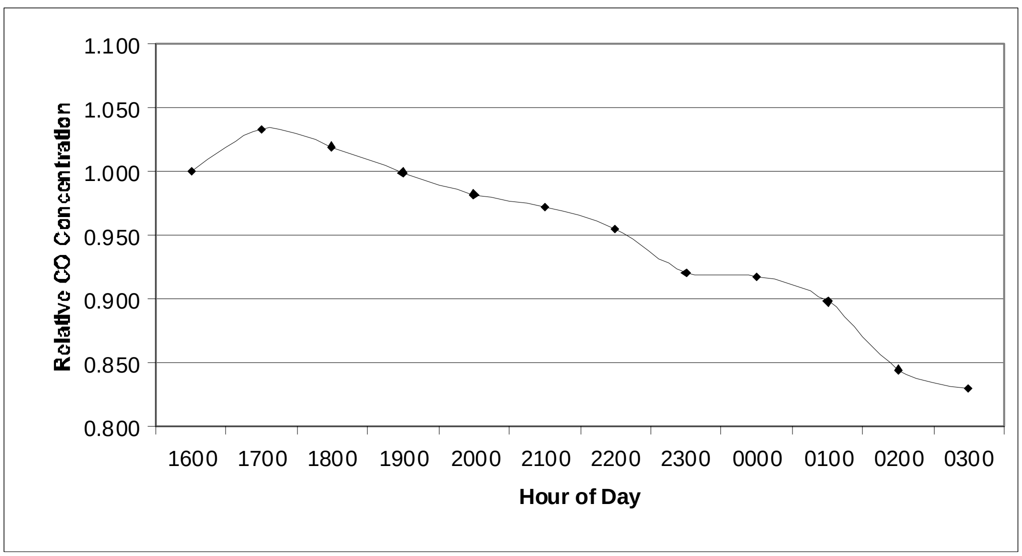
The physical model predicts that CO concentrations are directly proportional to the CO inventory estimated each year for an average winter day. This is a result of the analysis and is in no way an assumption or constraint. The physical model also predicts relationships to meteorological conditions that are consistent with the behavior displayed above:

- CO concentrations decline rapidly as temperatures fall below the reference temperature (T_0 = - 7 deg F), as a result of the ice fog effect represented by LoT10R.

- CO concentrations decline, but not as rapidly, as temperatures rise above the reference temperature as a result of the temperature-sensitivity of CO generation represented by HiT10R.
- Increased atmospheric trapping as represented by L1033 is associated with increased CO.
- Higher wind speeds are associated with decreased CO.

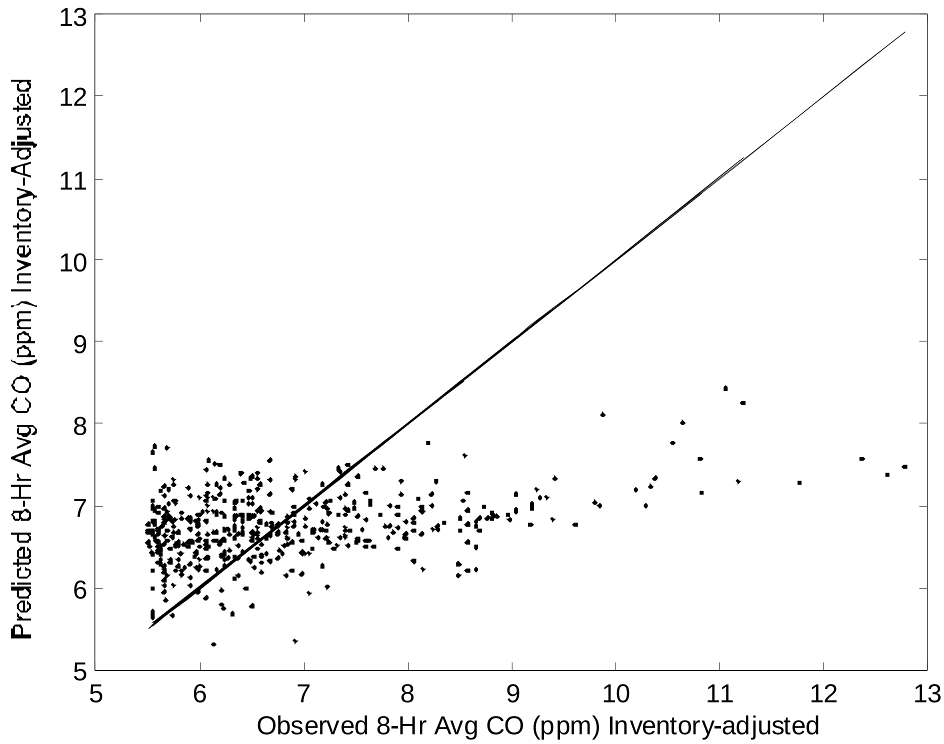
The dummy variables B_{hr} represent the average diurnal pattern of CO concentrations from late afternoon into the early morning hours. As shown in Figure 5, CO concentrations rise by several percent on average during the 1600 to 1800 hours (4 pm through 6 pm) period, followed by a progressive decline through the 0300 hour. Such a pattern is consistent with increased automotive emissions as people leave work in the afternoon followed by a slow dispersal of pollutants through the nighttime hours.

Figure 5
Average Diurnal Trend in CO Concentrations



While these trends are generally reasonable, it is also clear that the physical model has a relatively modest ability, measured by its R^2 of 0.415, to predict 8-hour average CO concentrations under the full range of conditions that occur. Figure 6 shows that the model predicts relatively well for conditions that lead to moderately high levels of CO (6 to 8 ppm on an inventory-adjusted basis), but it fails to predict the highest levels of CO that can occur. We interpret the physical model as predicting CO concentrations that occur under typical to severe, but not the most extreme, winter conditions.

Figure 6
Distribution of Residuals for the Physical Model



A variety of factors – including individual components of the CO inventory, alternative methods of measuring the strength of atmospheric trapping, and quadratic terms – were tested, without success, to determine if they would substantially improve the model predictions. A Components of Variance analysis indicates that the source of unexplained variation is predominantly related to factors that vary day to day (and are constant across the hours of the day), rather than factors varying hour to hour. Such factors can logically include variations in activity associated with entire days (weekdays versus weekend, or holidays versus non-holidays), or with large-scale weather conditions that tend to prevail for several days.

The apparent strength of the unknown effect(s) associated with the extreme peaks suggests large-scale synoptic meteorological conditions may be a candidate. A recent National Research Council report[5] concluded:

> *There is evidence that local meteorological conditions conducive to high CO concentrations are sometimes associated with large-scale meteorological and climatological phenomena. For example, all recent exceedances of the NAAQS for CO in Fairbanks have occurred with a low-pressure system in the Gulf of Alaska with cyclonic flow extending over Fairbanks. Although the role that this low-pressure*

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[5] Managing Carbon Monoxide Pollution in Meteorological and Topographical Problem Areas, National Research Council, April 2003

system plays is unclear, it might produce warm winds aloft that reinforce inversions near the ground.

Such an explanation is also consistent with the diurnal pattern estimated for the less-extreme days, which indicates that atmospheric trapping is less than complete so that some degree of CO dispersal can proceed during nighttime hours. If measures of large-scale synoptic conditions can be added to the meteorological database, it may be possible to improve the physical model in future research.

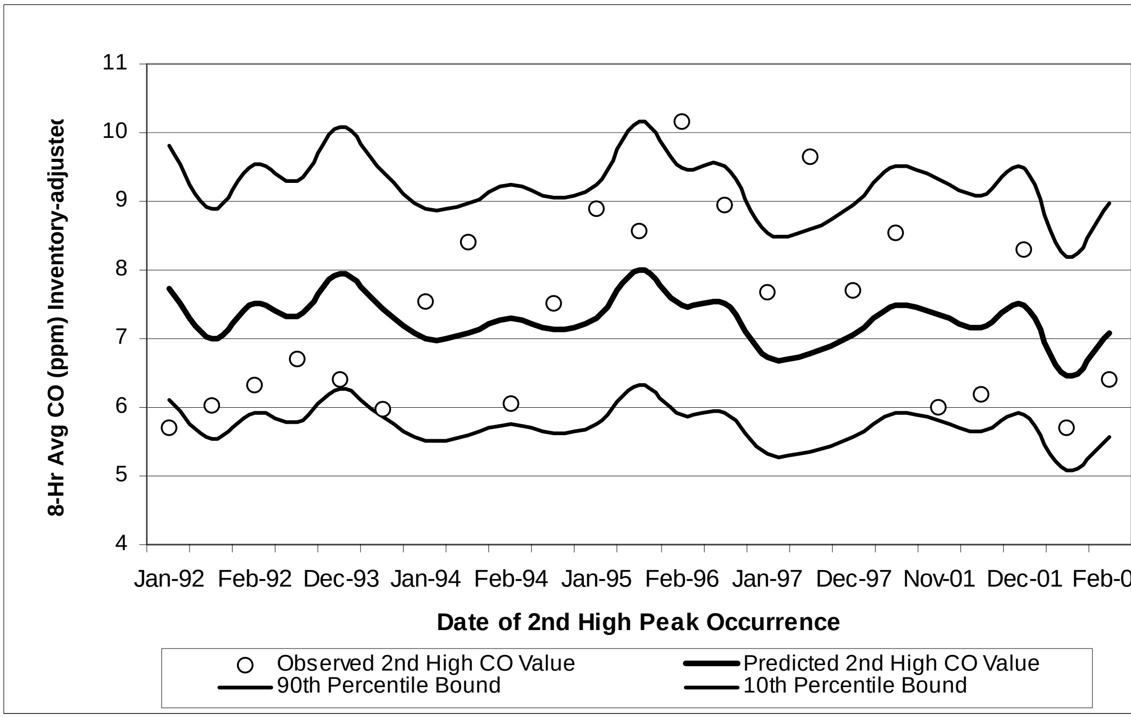
Calibration to Peak CO Values

Although estimated across a range of hourly periods giving elevated CO readings, the purpose of the physical model is to predict peak CO values as a function of environmental conditions. Given the evidence of under-prediction for the highest CO values, the physical model must be calibrated to permit its use for this purpose. A calibration was carried out by comparing the observed 2nd-high peaks that actually occurred at the three Fairbanks monitoring stations during the data period to the physical model's predicted CO concentrations under the same conditions. The comparison showed that the model's predicted CO values must be increased by 25.0 percent to give an unbiased prediction of peak CO values. When this adjustment is made, the calibrated model has an average error of less than 2 percent and predicts the individual peak values at the monitoring stations to within a standard deviation of ± 20.9 percent.

Figure 7 shows a comparison of the calibrated model to the observed 2nd-high peaks. The observed 2nd-high peaks are marked by open circles in the figure. The middle line marks the predicted value for the 2nd-high peaks, while the lower and upper lines mark the 10^{th} and 90^{th} percentiles in the confidence interval around the prediction. Ten percent of cases will lie above the upper boundary, and ten percent of cases will lie below the lower boundary. In general, the observed 2nd-high peaks have been at or above the predictions of the calibrated model during the mid-1990s, and below the calibrated predictions in the early 1990s and early 2000s. Although this pattern may appear visually to be systematic, there is no evidence at present that it is anything other than a coincidental occurrence.

Should additional research identify factors that improve the model's ability to predict CO concentrations under the most extreme conditions, then the improved model would demonstrate greater systematic variation, and less unexplained variation, in comparisons such as the one shown in Figure 7. Nevertheless, if the data points used here to calibrate the physical model are representative of the actual probability of occurrence for such a factor, then the current model's estimates (as calibrated) will still be unbiased estimates of peak CO values.

Figure 7
Prediction of 2nd-High CO Values by Calibrated Physical Model



Probabilistic Determination of Design Values

CO peaks are the result of what is inherently a stochastic (probabilistic) process in which meteorological conditions that support trapping of CO combine with increased activity levels to produce elevated CO readings at one or more monitors. A given level of CO may occur because meteorological conditions that cause partial trapping coincide with unusually high rates of CO generation, or because stronger trapping conditions coincide with lower rates of CO generation. The overall probability that a given level of CO will occur is the joint probability of occurrence for all of the causal factors.

From the viewpoint of this analysis, a given 8-hour average CO level will occur with a probability that depends on the following:

- Systematic changes in CO generation rates, including the CO inventory and the average activity level for the hourly period in question, that occur from one time period to another;
- The probability of occurrence for meteorological conditions that systematically affect CO generation, trapping and dispersal; and
- Unexplained variations in CO levels not related to systematic factors, including variations in actual activity level from the expected averages and variations in meteorological conditions not accounted for in the model.

The overall probability distribution for CO concentrations can be constructed in a bottom-up fashion using a Monte Carlo simulation. Conceptually, this is a simple process:

- Randomly select weather conditions from the time period under study to simulate a hypothetical winter period (Nov-Feb).
- Evaluate expected CO concentrations for each 8-hour period using the physical model and the 2002 inventory, so that resulting values pertain to calendar year 2002.
- Identify the 2nd-high non-overlapping peak using EPA criteria.
- Store the resulting 2nd-high CO value for the period and repeat the simulation.

Having run many repeated simulations, one can then plot the empirical distribution of 2nd-high CO values and determine the design values that correspond to any given probability of occurrence. The key assumption in such an approach is that weather in the future is accurately described by the mix of weather observed during the 9 year period for which meteorological data are available.

The methodology is complicated, however, by the need to sample weather conditions in an independent manner. Temperatures are highly correlated from one hour to the next, as are 8-hour average temperatures. Therefore, one cannot simply draw from the population of 1- or 8-hour temperatures that are observed in the data. While procedures exist to sample from a population subject to constraints posed by correlations, such procedures can be complex.

For this analysis, sampling was conducted on a daily basis, in which 24 hours of weather conditions are obtained at once whenever a particular day is chosen at random. Specifically:

- The day is defined to run from noon-noon, rather than midnight-midnight, to obtain an uninterrupted sequence of weather during the late afternoon, evening, and overnight periods when the 2nd-high peaks are recorded.
- The 4 winter months are divided into a total of 8 bimonthly pools from which days can be drawn, while retaining a representation of seasonal trends in weather. The days within each bimonthly pool are assumed to be differing outcomes of weather conditions that are possible in that two-week period of the winter.
- Sampling then chooses one day at random from the appropriate bimonthly pool to fill each of the 120 days in a simulated winter period from Nov 1 through Feb 28.

As an example, consider the sampling done to fill November for a simulated winter. For Nov 1st, one day is selected at random from the Nov 1 to Nov 15th pool that was created from such days in the years 1992-1997 and 2000-2002. The 24 hours of meteorological data that were recorded for the selected day are then attributed to Nov 1 in the simulated winter. The process is repeated to fill out Nov 2nd, Nov 3rd, ..., Nov 15th. Beginning with Nov 16th, days are drawn from the Nov 16 to Nov 30th pool of days that occurred during 1992-1997 and 2000-2002. The selection process is repeated until all 120 days of a simulated winter have been assigned weather conditions.

In essence, the sampling process mixes and matches individual days that have been observed to form a new, simulated winter period. A degree of simplification is introduced here, because weather remains correlated to some extent from one day to the next. Nevertheless, this correlation is much less than that which exists for conditions within a day.

Having selected meteorological conditions that characterize each day of the simulated winter, the simulation process is to:

1. Reduce the data to the hourly periods (1600 hours through 0300 the following morning) during which 2nd-high CO peaks have been observed.
2. Reduce the data to the hours for which atmospheric trapping occurs, as measured by L1033 > 0.
3. Apply the calibrated physical model to estimate the expected CO concentration for each hourly period, assuming the 2002 inventory.
4. Sort the simulated data in decreasing order of CO concentration and apply EPA criteria to determine when the 2nd-highest non-overlapping peak occurs. The criteria are (a) the first 8-hour period having no hourly overlap with the 1st highest peak, but (b) not more than 8 positions below the 1st highest peak.
5. Add random variation of individual CO values to the model-predicted value for the 2nd-high peak, and save the resulting CO concentration.

In step 3, the process estimates an expected 2nd-high CO value that corresponds conceptually to the middle line seen previously in Figure 7. Step 5 then adds the unexplained variation around the model's predictions, also seen in the figure, to map out the full range of possible outcomes for the 2nd-high CO values.

A total of N=1,000 complete 4-month winter periods, each consisting of 120 days, was simulated in this analysis to produce the empirical distribution of 2nd-high CO values for 2002 given in Figure 8. The horizontal axis is the probability of occurrence stated as a percent, and the vertical axis is the corresponding CO concentration (ppm) on the 2nd-high peak. A CO value that would be exceeded only 1 year in 10 is read at the 10 percent = 10^1 position on the horizontal axis, while one that would be exceed only 1 year in 100 is read at the 1 percent = 10^0 position.

Table 5 summarizes 2nd-high CO concentrations as a function of probability of occurrence. The CO values are standardized to the CO inventory for 2002 and therefore pertain to calendar year 2002.

Figure 8
Probability Distribution of 2nd-High CO Concentrations for 2002

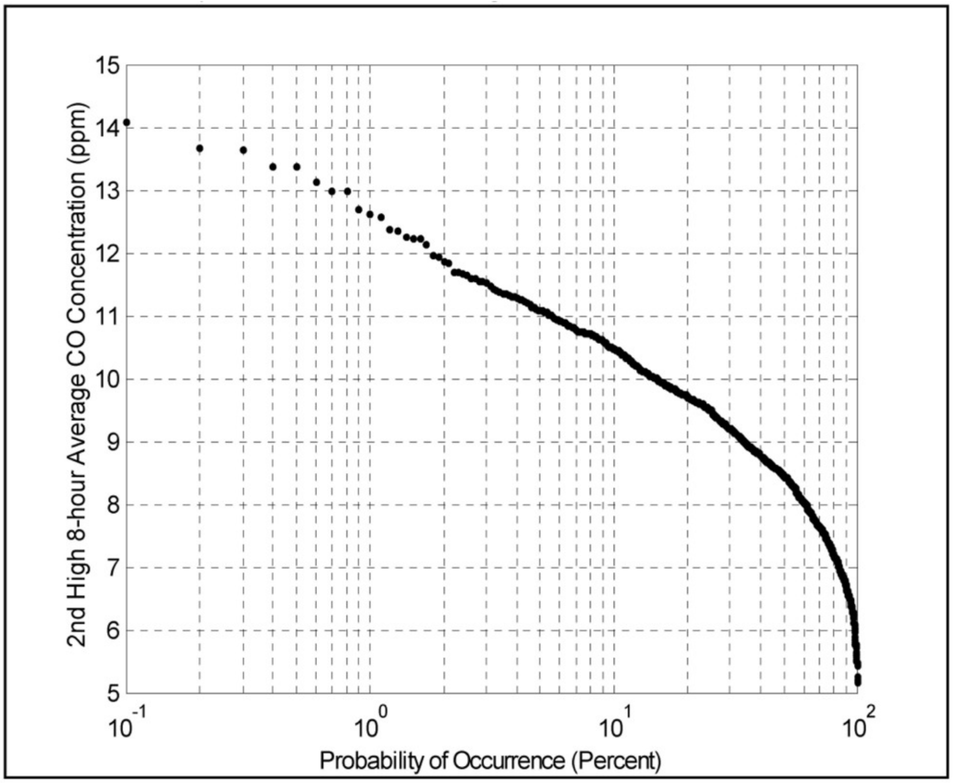


Table 5 2nd-High CO Concentrations for Fairbanks (As of Calendar Year 2002)		
Confidence Interval (1-sided)	**CO (ppm)**	**Probability of Occurrence**
80 percent	9.72	1 year in 5
90 percent	10.50	1 year in 10
93.3 percent	10.84	1 year in 15
95 percent	11.09	1 year in 20

Alaska Department of Environmental Conservation

Amendments to:

State Air Quality Control Plan

Vol. III: Appendices

Appendix III.C.10

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User's Guide to AKMOBILE6
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Report No. SR07-10-01

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prepared for:

Alaska Department of Environmental Conservation

October 23, 2007

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User's Guide to AKMOBILE6 –
Alaska Winter Vehicle CO Emission Factor Model

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1. INTRODUCTION

The Alaska Department of Environmental Conservation (ADEC) and the Anchorage Metropolitan Area Transportation Solutions (AMATS) agency have co-funded the development of an Alaska-specific version of EPA's MOBILE6 vehicle emission factor model called AKMOBILE6. This introduction provides a review of the background behind the development of the AKMOBILE6 model, the purpose for its development and use, and describes the organization of this user's guide.

1.1 Background

Motor vehicles have long been regarded as the dominant source of emissions in carbon monoxide (CO) nonattainment areas in Alaska. Motor vehicle emissions are typically computed for most areas of the United States using the MOBILE series of emission factor models developed by the Environmental Protection Agency (EPA). Although EPA's latest MOBILE6 emission factor model contains improvements over prior versions, it is still limited in its ability to represent wintertime CO emission factors in cold-weather communities. The MOBILE model does not adequately represent two very common wintertime vehicle operating practices in Alaska that significantly affect CO emissions:

1. Extended initial idling of vehicles to warm them up prior to travel; and

2. Use of "plug-in" heaters to keep the engine warm while parked for long periods to aid cold start drivability.

Surveys of vehicle activity in Anchorage[1][*] found that initial vehicle idling in the morning after an overnight soak averages roughly ten minutes in duration. Neither MOBILE6 nor its predecessors are well suited to explicitly represent extended initial vehicle idling.[†] In

[*] Superscripts denote references provided in Section 5 of this user's guide.

[†] The basic emission factors in these models are based on transient (i.e., stop-and-go) driving patterns and represent composite emission rates over the duration of these driving patterns. Although these transient patterns include idling, separate emission factors for only the idle periods do not exist. Although inputs to these models can be specified so they output "idle" emission rates, these so-called idle rates are based on transient emission factors corrected to a 5 mph speed that are multiplied by 5 mph to produce gram-per-hour rates. Thus, these derived rates are not based on actual emissions testing conducted at idle, nor do they reflect warm-up effects when a vehicle is idled for an extended period from a cold start.

addition, these models cannot easily account for emission benefits that occur when a vehicle is started after being plugged-in to an engine pre-heater.

Moreover, observational surveys of vehicle operations in both Anchorage and Fairbanks showed considerable differences in vehicle activity between each community. Extended initial idling after cold starts was more prevalent in Anchorage and "plugging in" was more common in Fairbanks.

The need to quantify emissions separately for each community, combined with EPA's MOBILE models not being able to address these vehicle operating practices, led to the following efforts:

- Testing studies to collect actual Alaskan vehicle emission measurements of initial idling with and without the use of plug-in heaters; and

- Development of an alternate methodology for estimating vehicle CO emissions in Alaska based on combining results from these testing studies with emission factors from MOBILE.

Each of these prior efforts is summarized below.

Alaska Vehicle Emission Testing and Driving Studies – A testing study[2] was conducted in Anchorage and Fairbanks during the winter of 1998-99 to collect actual measurements of initial idle emission rates. The study was performed for a sample of 111 automobiles and light-duty trucks under cold wintertime ambient conditions and measured minute-by-minute idle emissions as vehicles warmed up from a cold start (without being plugged-in to a pre-heater). For a subset of the same vehicles, "plug in" idle tests were also conducted under which vehicles were plugged in prior to the cold start. Analysis of the data from the 1998-99 idle study produced the following findings:

- Initial idle emission rates are significant under cold start conditions;

- Idle emission benefits from fleet turnover are overstated in MOBILE5b and the CO Emissions Model (predecessors to MOBILE6), based on a comparison of measured idle emissions by model year range to those predicted by MOBILE5b and the CO Emissions Model; and

- Use of plug-in pre-heaters during long soaks over four hours provides substantial initial idle CO emission reductions (over 70%) compared to cold start idling without prior plug-in.

To better understand the relationship between idle and trip-related emissions, Fairbanks, Anchorage, and ADEC funded a follow-on study[3] to develop a representative drive cycle for wintertime operating conditions in Alaska and used it to collect modal data for a representative sample of vehicles. The results of that study showed that the combination of snow and ice on roadways in Fairbanks and Anchorage limits the amount of high speed and high acceleration rates compared to that observed in the lower 48 states. As a result, wintertime driving in Alaska is very similar to the drive cycle specified in the Federal Test Procedure (FTP). It also means that the high acceleration rates addressed in the Supplemental FTP (SFTP) do not occur in Alaska during the winter. As a result, the significant CO reductions anticipated from federal regulations that control emissions during off-cycle operation (e.g., hard accelerations) are not applicable during the winter in Alaska. This means that the CO reductions associated with the SFTP regulations employed in MOBILE6 should not be included in wintertime vehicle CO emission estimates in Alaska.

"Hybrid" Methodology Spreadsheet Model – As a result of these findings, a revised vehicle CO emission calculation methodology was developed within a spreadsheet model to overcome limitations of MOBILE5b and the CO Emissions Model in representing vehicle CO emissions in Alaska that:

- Utilized idle and plug-in test results from the 1998-99 study to characterize initial idling emissions that occur during winter in Alaska;

- Employed emission factors from the CO Emissions Model to calculate subsequent on-road emissions that occur as a vehicle travels after initial idle; and

- Disabled CO reduction benefits in the CO Emissions Model associated with SFTP regulations that are not applicable to wintertime driving patterns in Alaska.

This spreadsheet model was used to produce motor vehicle CO emission inventory estimates incorporated in recent Alaska CO SIP revisions[4,5] which were subsequently approved by EPA.[6,7]

Though conceptually straightforward, the "hybrid" approach employed in the spreadsheet model was necessarily complex because the measured idle emission rates had to be blended together with trip-based CO Emissions Model emission factors. The effects of the initial idling, already accounted for using the measured idle test rates, had to be "backed-out" of the CO Emissions Model emission factors, which are based on the "cold start," "stabilized," and "hot start" bags of the Federal Test Procedure (FTP).

To accomplish this blending, the methodology employed what is subsequently referred to as "thermal state" tracking. Stated simply, thermal state tracking consisted of determining how warmed-up a vehicle is at each of the following points in a vehicle trip:

- Before start-up;
- After initial idling; and
- "Overall" for the on-road traveling portion.

A detailed description of this methodology was documented in the Fairbanks CO emission inventory.[4]

1.2 AKMOBILE6 Purpose and Design Requirements

Because the spreadsheet-based hybrid CO model was developed to support calculation of vehicle emission inventories in the Anchorage and Fairbanks CO SIPs, it was not designed with a high degree of user-friendliness. As a result, it could not be easily re-configured to support other types of vehicle emission factor outputs such as used in roadway hot-spot modeling. Moreover, it had been designed to work with MOBILE5b and the CO Emissions Model, not EPA's newest vehicle emission factor model, MOBILE6.

Thus, AKMOBILE6 was developed for the following reasons:

1. To incorporate the thermal state tracking methodology contained in the spreadsheet model into an easier-to-use standalone executable program;

2. To operate in conjunction with EPA's latest vehicle emission factor model, MOBILE6; and

3. To output vehicle CO emission factors for a variety of end uses (SIP inventories, roadway hot-spot modeling, transportation conformity analysis, etc.).

As explained in greater detail later in this user's guide, the AKMOBILE6 model was developed as a "shell" or driver program that runs EPA's MOBILE6 model automatically during execution. The MOBILE6 executable program called by AKMOBILE6 is the latest executable, MOBILE6.2.03, released on September 24, 2003 by EPA for use in Alaska. To address EPA's concerns that AKMOBILE6 only be used to calculate warm-up initial idling emissions that occur during Alaskan winters, the MOBILE6 program executed from within AKMOBILE6 is an unedited version of the original executable distributed by EPA.

In addition, the AKMOBILE6 model was designed to read and process user commands in an input file structure identical to that used by MOBILE6. As a result, both models can output emission factors from the exact same input file. (The manner in which this was accomplished is discussed later in Section 3.)

1.3 Organization of the User's Guide

Following this introductory section, the reminder of the AKMOBILE6 user's guide is organized as follows.

Section 2 provides basic instructions for installing and setting up the AKMOBILE6 model on your computer. It discusses the computing platform(s) under which AKMOBILE6 can be executed and describes the steps needed to get the model up and running.

Section 3 describes how to use AKMOBILE6. It discusses how to create the input command files required to run the program. It explains how AKMOBILE6 has been designed to “share” the same input command file used by MOBILE6, discusses how the program runs in conjunction with MOBILE6, and details the special input command parameters needed by AKMOBILE6 to compute initial idling emissions.

Section 4 presents a detailed summary of the technical improvements contained in AKMOBILE6 compared to the original spreadsheet model.

Section 5 provides a list of cited references.

Finally, Appendices A and B contain listings of sample input and output files used and generated by AKMOBILE6, respectively.

###

2. INSTALLATION AND SETUP

This section explains how to install the AKMOBILE6* model on your computer. It also provides a basic summary of how to set up and run the model. Further details on using and operating AKMOBILE6 and examples of its inputs and outputs are provided in Section 3.

2.1 Computer Requirements

The AKMOBILE6 program runs on personal computers using Microsoft's Windows operating system. AKMOBILE6 has been successfully tested on the following versions of Windows:

- Windows 98 (First or Second Edition);
- Windows 2000 (Standard or Professional); and
- Windows XP (Home or Professional).

AKMOBILE6 does not employ a graphical user interface (although it is still simple to use). Since it uses "text mode" to display information on the screen, graphical display resolution (e.g., 800 × 600) and color depth settings you've specified in Windows are not relevant. Therefore AKMOBILE6 will operate successfully in "text mode" regardless of your Windows video display settings.

AKMOBILE6 uses EPA's MOBILE6 model. Thus, you must also have installed MOBILE6 installed on your computer for AKMOBILE6 to operate. (See EPA's MOBILE6 web site at http://www.epa.gov/otaq/m6.htm for further instructions on installing MOBILE6 on your computer.)

The AKMOBILE6 program file (called AKMOB6.EXE) requires less than 400 KB of disk space. As discussed earlier, AKMOBILE6 also calls the MOBILE6 program. MOBILE6 and its associated external input files require between 1.4 and 2.3 MB of disk space, depending on the number of external files read by MOBILE6. AKMOBILE6 input files generally require less than 50 KB of disk space each, although the input file size is directly related to the number of analysis scenarios it contains. (AKMOBILE6 can process up to 10,000 analysis scenarios in a single input file.) Output files generated by

* The version of AKMOBILE6 reflected in this users guide is Version 1.10E, dated July 2004.

AKMOBILE6 are also a function of the number of analysis scenarios being run, but generally require less than 300 KB of disk space each.

2.2 AKMOBILE6 Installation

Installing the AKMOBILE6 modeling package is easy. Simply copy the installation file **AK6INSTL.ZIP** to any directory on your computer. Since AKMOBILE6 uses MOBILE6 and shares the same input files, the simplest place to put it is in the "run" directory where you've already installed MOBILE6 (e.g., C:\MOBILE62\RUN). However, you can install AKMOBILE in any directory of your choice.

The installation file is a compressed "ZIP" file that contains the following files:

- AKMOB6.EXE – the AKMOBILE6 executable program;
- M6NAME.DAT – a file read by AKMOBILE6 that names the MOBILE6 program file to be called by AKMOBILE6;
- ATEST1.IN – a sample AKMOBILE input file;
- ATEST1.OUT – a sample AKMOBILE6 output file;
- MOBILE62.EXE – EPA's latest release of the MOBILE6 executable program file, Version 6.2.03 dated September 2003;
- TECH12.D – a MOBILE6 I/M credits file used for most Alaska fleet MOBILE6 runs; and
- LF90.ERR – an error library file used by MOBILE6.

Installation to Existing MOBILE6 Directory - If you are installing AKMOBILE6 into the same directory where you have already installed MOBILE6, you will need to keep a couple of things in mind. As listed above, the installation ZIP file includes the latest version of the MOBILE6 program file (MOBILE62.EXE). If you don't already have this September 2003 release of MOBILE6 on your computer, you should obtained a copy from EPA by emailing a request to mailto:mobile@epa.gov and install it before copying the AKMOBILE6 installation files into the same directory. Then, when you unzip AK6INSTAL into this directory, you can reply "No" when prompted to overwrite the existing MOBILE62.EXE, TECH12.D and LF90.ERR files.

Installation to New Directory – If you choose to install AKMOBILE6 into a new empty directory to keep it separate from your MOBILE6 files (or don't have access to the Internet to easily download EPA's MOBILE6 model), the installation file contains all of the files you will need to use AKMOBILE6 for most* Alaskan analysis scenarios. Simply unzip all the files in the AK6INSTL.ZIP installation file into the new directory you've created. (As noted earlier, the installation file includes both the AKMOBILE6 program itself [called AKMOB6.EXE] and the latest version of EPA's MOBILE6 model [MOBILE62.EXE] that is executed automatically by AKMOBILE6.)

2.3 Basic Setup and Execution

Once installation of AKMOBILE6 has been completed, the following paragraphs explain how to first configure the model to run with MOBILE6, how to launch the AKMOBILE6 program, and how to examine and work with its outputs.

MOBILE6 Version Setup – The AKMOBILE6 program, which executes MOBILE6 within a "shell," has been designed in a flexible manner that allows it to work with any release of EPA's MOBILE6 model (e.g., MOBILE6.0, MOBILE6.1, Draft MOBILE6.2), although you are strongly encouraged to use EPA's latest version (dated October 2003 as of this writing). Instructions for configuring AKMOBILE6 to work with a specific version of MOBILE6 are explained below.

One of the installation files used by AKMOBILE6 is a file called **M6NAME.DAT**. This file is simply a single-line text file that contains the name (and optionally the directory path) of the specific MOBILE6 executable program you want AKMOBILE6 to run. By default, M6NAME.DAT contains the string "MOBILE62.EXE," which directs AKMOBILE6 to run the MOBILE6.2 executable located in the same directory where AKMOBILE6 is installed. If you need to run AKMOBILE6 using a different version of MOBILE6, simply edit the M6NAME.DAT file (using any text editor) to point to a different version of MOBILE6. For example, you could enter:

```
C:\MOBILE6\RUN\MOBILE6.EXE
```

if you wanted AKMOBILE6 to invoke Version 6.0 of MOBILE6, located in a different directory than where you've placed AKMOBILE6.

IMPORTANT!!! When you make changes to the M6NAME.DAT file, remember to save it with the same name (i.e., M6NAME.DAT). Otherwise AKMOBILE6 will still look for MOBILE62.EXE in its installed directory.

Note that this design was intended for allowing AKMOBILE6 to work in conjunction with possible future releases of MOBILE6, without having to update AKMOBILE6.

* Depending on the vehicle fleet characteristics being modeled, MOBILE6 reads certain data such as Inspection and Maintenance (I/M) program credits from external files. The AKMOBILE6 installation file includes one of these files, TECH12.D, which is most commonly used to model program benefits for Alaska's existing I/M programs in Anchorage and Fairbanks. For wintertime Alaska CO emission factors, this is the only external data file likely to be needed by MOBILE6.

Running the Program - Once you have set up the AKMOBILE6 program to work with MOBILE6 as described above, there are several different ways that you can run the program. These will be familiar to you if you already use Windows.

- Create and launch a shortcut to the AKMOB6.EXE application;
- Double-click the AKMOB6.EXE file from within the Windows Explorer window;
- Right-click the AKMOB6.EXE file and click "Open" from the pop-up menu; or
- Open a "Command Prompt" window (from the Start Menu, click Programs / Accessories / Command Prompt from the drill-down menus), set your default directory to the location where you installed AKMOBILE6, and type either:

  `AKMOB6`

  or

  `AKMOB6 {`*`InputFile`*`}`

  at the command prompt.

The latter form for running the model from a command prompt window also enables you to supply the input file you want to run right on the command line. For example, if your input file is named MYFILE.IN, you simply type **`AKMOB6 MYFILE.IN`** to launch AKMOBILE6 and produce emission factors for the analysis scenarios contained in the MYFILE.IN input file. (Note that you must type at least one space between AKMOB6 and your input file name.) This form is useful when you want to perform a whole series of AKMOBILE6 runs from within a batch command file.

If you launch the program using any of the first three ways or by simply typing "AKMOB6" on the command line, you'll see the following prompt:

```
Filename missing or blank – please enter file name
Unit 1?
```

In response, you simply type in the name of your input file (e.g., **`MYFILE.IN`**).

While it is running, AKMOBILE writes information to your screen indicating progress through each of its processing steps. If your model runs executes without any errors, the following message is displayed:

```
----------------------------------------------------------
 AKMOBILE6 RUN COMPLETED SUCCESSFULLY - HIT ENTER TO END
----------------------------------------------------------
```

If an error occurs during execution (e.g., your input file contained invalid or missing commands needed by AKMOBILE6 or MOBILE6), a message specific to that error will be displayed so you can diagnose and correct the problem.

AKMOBILE6 Output - AKMOBILE6 produces an output file of CO emission factors for each analysis scenario contained in your input file using the same root name as the input file, but a file suffix of ".OUT." For example, the output file generated from processing MYFILE.IN would be named MYFILE.OUT. This output file is structured similarly to the "spreadsheet" output file format used by MOBILE6. The AKMOBILE6 output file is tab-delimited and includes a single header record of data field name that can be easily imported into any commonly available spreadsheet or database program for viewing, printing, and subsequent analysis.

###

3. USING AKMOBILE6

This section of the user's guide expands upon the basic instructions for running the AKMOBILE6 model that were presented at the end of the preceding section. It assumes the reader is proficient with EPA's MOBILE6 model and input command structure.

First, it presents an overview of how the model works in conjunction with as-released versions of EPA's MOBILE6 vehicle emission factor model. It also describes how to set up input "command" files required by AKMOBILE6 and MOBILE6 and details the specific commands used by AKMOBILE6 to compute initial idling emissions. Finally, it describes the CO emission factor outputs produced by the model and discusses how to view and use these output files.

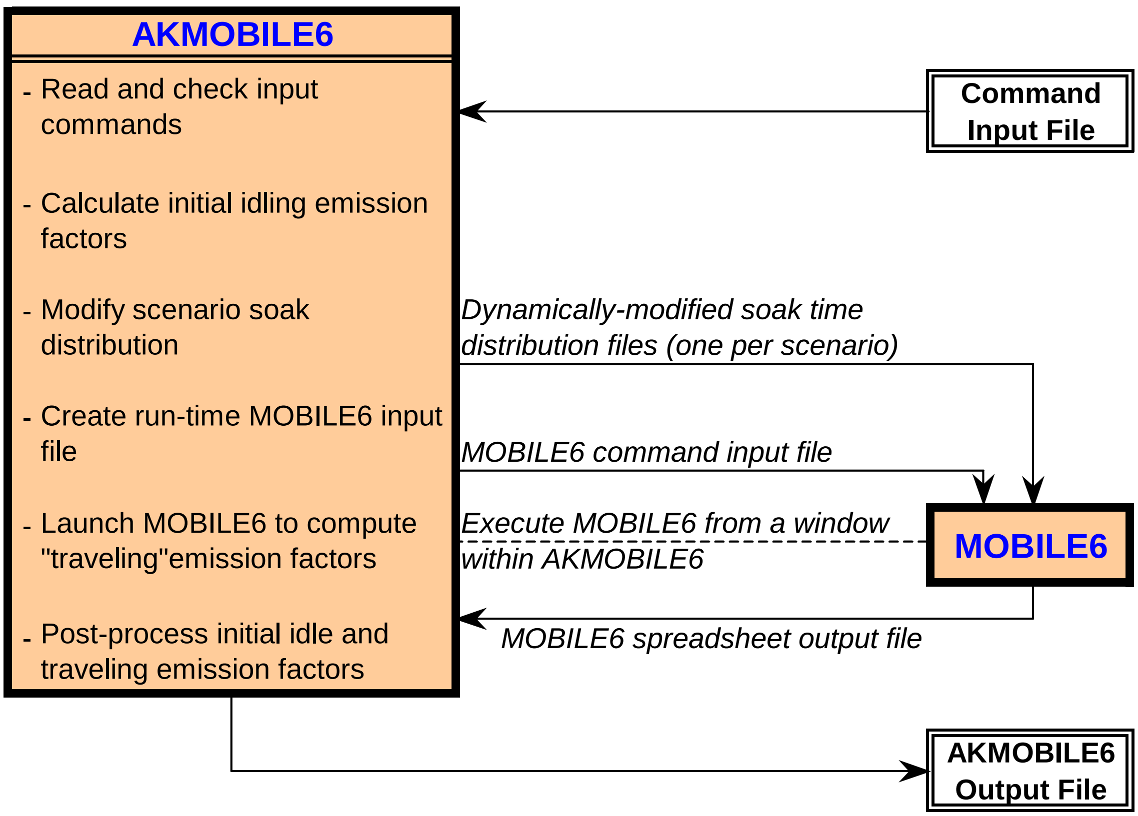
3.1 Overview of Program Flow

As stated earlier in Section 1, AKMOBILE6 was developed to improve upon a series of spreadsheet calculations developed under earlier Alaska CO SIP inventory efforts[4] that accounted for shortcomings in EPA's MOBILE models in calculating vehicle emissions under extended initial idling events, which are common in Alaska during winter. The calculation methodology in AKMOBILE6 uses a concept called "thermal state tracking" to estimate how warmed up or cooled off a vehicle's engine and emission control system are prior to the start of a trip and after initial idling based on how long it was parked before being started,* the ambient temperature, and the length of the initial idling event.

AKMOBILE6 was designed as a simple-to-use executable program that computes vehicle CO emissions during initial idling based on actual vehicle emission test measurements conducted in Alaska during winter. AKMOBILE6 was designed to operate as a "shell" program written around as-released (i.e., unmodified) versions of EPA's MOBILE6 model in order to calculate both initial idling and "traveling" (i.e., after initial idle) CO emission factors. AKMOBILE6 computes initial idling emission factors and then automatically executes MOBILE6 to calculate traveling emission factors for each input analysis scenario. Both types of emission factors are then combined into a single tabular output file produced by AKMOBILE6. These processes and the program and data flow between AKMOBILE6 and MOBILE6 are summarized in Figure 3-1.

* The amount of time a vehicle was parked prior to startup is called "soak time."

Figure 3-1
Illustration of AKMOBILE6 Program Flow



AKMOBILE6 first inputs and validates the commands in the input file. (As explained in the following sub-section, AKMOBILE6 uses command inputs similar to MOBILE6. However, since the model is designed to produce wintertime CO emission factors under cold weather conditions, some of the MOBILE6 commands, such as those that output emission factors for other pollutants, cannot be used by AKMOBILE6.) These command checks ensure that the input file contains only those commands expected by AKMOBILE6 to work properly.

Idle emissions are then calculated from curve-fitted test measurements and the length (in minutes) of the initial idling event. For each analysis scenario, the user must define the ambient temperature, the soak time, and the length of the initial idling event for AKMOBILE6 to perform these calculations.

The thermal state of the vehicle after initial idling is also determined. Since MOBILE6 is used within AKMOBILE6 to calculate traveling emission factors for the actual trip that follows an initial idling event, this after-idle thermal state must be translated into an equivalent MOBILE6 input. This input is the soak time within the soak distribution file read by MOBILE6 and can be used to simulate the degree of warm-up of a vehicle after any prior soak and initial idle. (As explained in greater detail in Section 4, the equivalent soak time calculated by AKMOBILE6 is not equal to the soak time input within the analysis scenario, even in the absence of initial idling.)

AKMOBILE6 dynamically creates a series of soak distribution files that reflect the equivalent after-idle soak times for each scenario. It also creates a "run-time" MOBILE6 input file containing "SOAK DISTRIBUTION" commands that invoke these soak distribution files for each analysis scenario. Once these steps are completed, AKMOBILE6 automatically launches MOBILE6 to calculate the traveling emission factors for each analysis scenario. The run-time input file and soak distribution files are fed to MOBILE6 as inputs needed to reflect the "after-idle" thermal state and properly calculate traveling emission factors for each scenario.

After MOBILE6 has completed execution from within AKMOBILE6, post-processing is performed to combine the initial idle emission factors (in grams/trip) computed by AKMOBILE6 with the after-idle traveling emission factors (in grams/mile) calculated by MOBILE6. AKMOBILE6 creates a single output file that displays both of these emission factors for each analysis scenario contained in the input file.

3.2 Command Input File

Overall Structure - The AKMOBILE6 command input file is a simple ASCII "text" file that can be created or edited with any text editor program. (Word processing programs can also be used to edit and create the command input file, but it must be saved as ASCII text.) To make AKMOBILE6 as easy to use as possible, it was designed to use the same commands and input structure as EPA's MOBILE6 model. As explained below, existing MOBILE6 command input files need only minor modifications to be properly processed by AKMOBILE6.

The AKMOBILE6 command input file utilizes the same overall structure as its MOBILE6 counterpart. As in MOBILE6, command input files consist of three distinct sections:

- Header section – controls overall input, output and program execution;
- Run section – contains vehicle fleet-related parameters to represent local fleet characteristics and control programs; and
- Scenario section – describes conditions for individual analysis scenarios being modeled.

For more information on the detailed commands and contents within each of these sections, refer to the MOBILE6 user's guide.[8]

As in MOBILE6, you can include multiple Scenario sections within each Run section and multiple Run sections in a single command input file. AKMOBILE6 can process command input files with up to 10 Run sections and 1,000 Scenario sections per Run section, accommodating up to 10,000 individual analysis scenarios in a single input file.

Special AKMOBILE6 Initial Idle Command – In order to perform the thermal state tracking calculations needed to compute initial idling emission factors, several additional parameters not used in MOBILE6 must be specified in the AKMOBILE6 command input file:

- Soak input option ("S" for soak time, "F" for cold/hot start fractions);
- Soak time (in hours), or alternatively, cold start and hot start fractions;*
- Initial idle time (in minutes); and
- Plug-in heater use fraction (a value between 0 and 1 representing the fraction of vehicle trips for which plug-in heaters were used prior to the trip).

These special parameters are specified using an "INITIAL IDLE" command, which can appear anywhere in the Scenario section after the initial SCENARIO RECORD" command.

IMPORTANT!!! The "INITIAL IDLE" command must be preceded by a ">" symbol as the first character on the command line as shown below:

```
> INITIAL IDLE      :
```

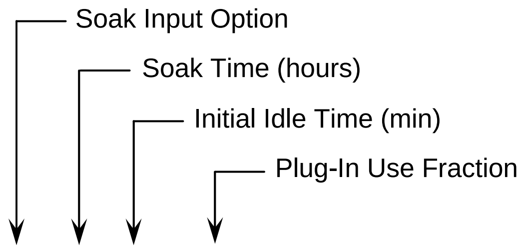
This is because MOBILE6 treats lines in the command input file that begin with the ">" symbol as comment lines and simply skips them during processing. Since "INITIAL IDLE" is a special AKMOBILE6 command that is not used by MOBILE6, this allows the same command input file to be processed directly by either AKMOBILE6 or MOBILE6.

The initial idle-related parameters are then specified in the order listed above after the colon ":" character on the INITIAL IDLE command line, separated by either commas or spaces. These parameters can be provided in either of two forms dictated by the first

* As defined here, cold and hot-start fractions refer to the split of all vehicle trips that are either treated as fully cold (reflecting a 12-hour or overnight soak) or fully warmed-up (reflecting a 10-minute soak), respectively. These fractions must sum to 1 and can be used as an alternative to input of a single soak time to be compatible with input files created for earlier versions of MOBILE that required operating mode fraction inputs.

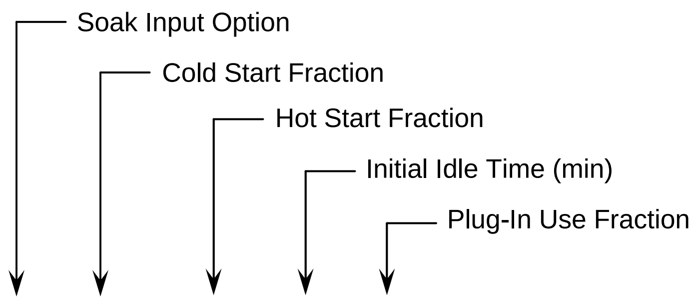
parameter, the Soak Input Option. A value of "S" indicates a single soak time will be specified; a value of "F" denotes both cold start and hot start fractions follow. Examples of both of these forms are shown below.

Single Soak Time Form:




```
> INITIAL IDLE      : S, 8, 5, 0.80
```

Start Fractions Form:




```
> INITIAL IDLE      : F, 0.90, 0.10, 5, 0.80
```

In the first example, a single soak time of eight hours is specified. In the second example, cold and hot start fractions of 0.90 (90%) and 0.10 (10%), respectively, are specified. In both examples, the initial idle time is five minutes and the plug-in use fraction in 0.80, indicating that 80% of all vehicle trips are assumed to "use" plug-in heaters.

No other special commands are required by AKMOBILE6. However, there are some minor limitations to the number of MOBILE6 commands that AKMOBILE6 can process. These limitations are explained below.

<u>Command Restrictions</u> – MOBILE6 can produce vehicle emission factors for a number of individual pollutants, seasonal conditions and time periods (i.e., daily vs. hourly). It can also output results in several different layouts, termed "Report," "Spreadsheet," and "Database." AKMOBILE6 was intentionally designed with less flexibility since its purpose is to produce Alaskan fleet CO idling and traveling emission factors under cold winter conditions.

To minimize the programming needed to make AKMOBILE6 work in conjunction with MOBILE6 toward this purpose, several restrictions exist on the MOBILE6 commands that can be used in AKMOBILE. These command restrictions are listed and discussed below, grouped by section type (i.e., Header, Run and Scenario).

Header Section Command Restrictions

- CO Emission Factors Only – The header section must contain the command:

  ```
  POLLUTANTS           : CO
  ```

  since AKMOBILE6 was designed to output only CO emission factors.

- Output Layout – You must specify the "spreadsheet" output style using the

  ```
  SPREADSHEET          :
  ```

  command. The Descriptive and Database output layouts in MOBILE6 are not supported in AKMOBILE6.

- No other Header commands (e.g., REPORT FILE, NO DESC OUTPUT) can be used in AKMOBILE6.

Run Section Command Restrictions

- VMT Fractions – If the "VMT FRACTIONS" command is used to apply a local vehicle fleet mix instead of the national default values contained in MOBILE6, this command must appear in the Run section. (MOBILE6 allows VMT fractions to be specified in either the Run or Scenario sections.)

Scenario Section Command Restrictions

- Winter Season – The "EVALUATION MONTH" command in the Scenario section must specify January (i.e., a value of "1") as the evaluation month to ensure AKMOBILE6 executes under the seasonal conditions for which it is valid.

With these noted exceptions, the remainder of the MOBILE6 command set can also be used in AKMOBILE6. This includes commands commonly used in Alaska vehicle emission factor modeling such as those for specifying local fleet characteristics (i.e., registration distributions and mileage accumulation rates), Inspection and Maintenance (I/M) and oxygenated fuel program characteristics, and "disabling" benefits of supplemental FTP controls within MOBILE6.

This latter element, supplemental FTP disablement, is discussed in greater detail below, since the command used to disable supplemental FTP benefits in MOBILE6 is not documented in the MOBILE6 user's guide.

Disabling Supplemental FTP Benefits in MOBILE6 – An earlier study[9] that measured stop-and-go driving patterns of Alaskan vehicles under winter conditions found that snow and ice on the roadways limit the amount of high speed and high acceleration rate operation compared to that in the lower 48 states. Wintertime driving patterns in Alaska were found to be very similar to those specified in the Federal Test Procedure (FTP) driving cycle. The high acceleration rates addressed in the Supplemental FTP (SFTP) do not occur in Alaska during the winter. As a result, the significant CO reductions anticipated from federal regulations that control emissions during high acceleration events are not applicable during Alaskan winters. This means that the CO reductions associated with the SFTP regulations that were built into MOBILE6 should be disabled when modeling wintertime CO emission factors in Alaska.

MOBILE6 includes an undocumented command, "NO SFTP SPEED", that can be placed anywhere in the Scenario section of the command input file to disable or zero-out the default emission benefits of supplemental FTP controls calculated by the model. This command line is shown below:

```
NO SFTP SPEED      :
```

It should generally be included in the Scenario section of the AKMOBILE6 command input file for each analysis scenario being modeled.

Appendix A shows a sample AKMOBILE6 command input file. It contains one Run section and 144 Scenario sections that examine different combinations of soak time, initial idle time, and plug-in use. (MOBILE6 users will note that it is identical to a MOBILE6 input file, with the exception of the "INITIAL IDLE" command.)

IMPORTANT!!! Note that the external soak distribution file listed in each scenario section "SOAKDST.CLD" is not actually used when processed by AKMOBILE6. As explained earlier in Section 3.1, the program dynamically creates a separate soak distribution file for each scenario during execution to reflect the after-idle thermal state and equivalent soak time for that scenario. The run-time soak files are then passed to MOBILE6 when it is automatically executed by AKMOBILE6 to calculate after-idle traveling emission factors. The run-time soak files are then deleted when AKMOBILE execution completes.

3.3 AKMOBILE6 Output File

The output file produced by AKMOBILE6 is similar to that of the "spreadsheet" output layout used by MOBILE6. Like the MOBILE6 spreadsheet output, the AKMOBILE6 output file is a tab-delimited ASCII file. For each analysis scenario processed from the command input file, three records are written to the AKMOBILE6 output file:

1. VMT Mix record – showing travel fractions by vehicle class (that were input to the model);

2. Idle Emission Factor record – giving initial idle CO emission factors in grams/trip for the composite vehicle fleet and separately by vehicle class for gasoline-powered cars and light-duty trucks;* and

3. Traveling Emission Factor record – containing after-idle "traveling" CO emission factors in grams/mile both for the composite vehicle fleet and all individual vehicle classes.

As described in Section 2.3, the AKMOBILE6 output file has the same "root" name as the command input file, with a ".OUT" suffix. For example, AKMOBILE6 creates an output file named MYFILE.OUT when processing a command input file named MYFILE.IN.

The tab-delimited output file can be imported in a single step into any spreadsheet or database program. Like the MOBILE6 spreadsheet output file, it also includes column headers in the first row that name each of the data fields displayed in tabular fashion. The data fields written to the AKMOBILE6 output file are a subset of those contained in the MOBILE6 spreadsheet file and are listed (and defined) in left-to-right order as follows:

- Run - Run section number
- Scenario - Scenario number within Run section
- Description - descriptive scenario name
- CY - calendar year
- Parameter - output parameter, either VMT Mix, CO-Idle or CO-Trav
- Units - output parameter units
- AmbTemp - ambient temperature during trip (°F)
- SoakTemp – minimum ambient temperature during preceding soak (°F)
- I/M? - I/M program modeled (Yes or No)
- Avg Spd - average vehicle speed (mph)
- ALL VEH - composite average across all vehicle classes
- LDGV - light-duty gasoline vehicles (passenger cars)
- LDGT1 - light-duty gasoline trucks 1 (0-6,000 lbs GVWR, 0-3,750 lbs LWV)
- LDGT2 - light-duty gasoline trucks 2 (0-6,000 lbs GVWR, 3,751-5,750 lbs LWV)
- LDGT3 - light-duty gasoline trucks 3 (6,001-8,500 lbs GVWR, 0-5,750 lbs LWV)
- LDGT4 - light-duty gasoline trucks 4 (6,001-8,500 lbs GVWR, 5,751+ lbs LWV)

* Initial idling emission factors are calculated only for gasoline-powered cars and light-duty trucks, based on those vehicle types for which actual test measurements were collected. This covered the LDGV and LDGT1-LDGT4 vehicle classes used in MOBILE6.

- HDGV2B - class 2B heavy-duty gasoline vehicles (8,501-10,000 lbs GVWR)
- HDGV3 - class 3 heavy-duty gasoline vehicles (10,001-14,000 lbs GVWR)
- HDGV4 - class 4 heavy-duty gasoline vehicles (14,001-16,000 lbs GVWR)
- HDGV5 - class 5 heavy-duty gasoline vehicles (16,001-19,500 lbs GVWR)
- HDGV6 - class 6 heavy-duty gasoline vehicles (19,501-26,000 lbs GVWR)
- HDGV7 - class 7 heavy-duty gasoline vehicles (26,001-33,000 lbs GVWR)
- HDGV8A - class 8A heavy-duty gasoline vehicles (33,001-60,000 lbs GVWR)
- HDGV8B - class 8B heavy-duty gasoline vehicles (60,001+ lbs GVWR)
- LDDV - light-duty Diesel vehicles (passenger cars)
- LDDT12 - light-duty Diesel trucks 1 & 2 (0-8,500 lbs GVWR)
- HDDV2B - class 2B heavy-duty Diesel vehicles (8,501-10,000 lbs GVWR)
- HDDV3 - class 3 heavy-duty Diesel vehicles (10,001-14,000 lbs GVWR)
- HDDV4 - class 4 heavy-duty Diesel vehicles (14,001-16,000 lbs GVWR)
- HDDV5 - class 5 heavy-duty Diesel vehicles (16,001-19,500 lbs GVWR)
- HDDV6 - class 6 heavy-duty Diesel vehicles (19,501-26,000 lbs GVWR)
- HDDV7 - class 7 heavy-duty Diesel vehicles (26,001-33,000 lbs GVWR)
- HDDV8A - class 8A heavy-duty Diesel vehicles (33,001-60,000 lbs GVWR)
- HDDV8B - class 8B heavy-duty Diesel vehicles (60,001+ lbs GVWR)
- MC - motorcycles
- GAS BUS - all gasoline buses
- URB BUS - Diesel transit and urban buses
- COM BUS - Diesel school buses
- LDDT34 - light-duty Diesel trucks 3 & 4 (6,001+ lbs GVWR)

The idle and traveling emission factors are listed <u>separately</u> (rather than being combined into a single emission factor) in the AKMOBILE6 output file so the results can be used in a wider variety of applications. For example, MOA prepares spatially gridded CO emission inventories for Anchorage. By keeping the idle and traveling factors separate, the idle factors can be applied to trip starts based on soak time and/or initial idling behavior unique to each grid cell while the traveling factors can be combined with VMT activity data.

On the other hand, to compare the relative magnitude of idle and traveling emission factors over a "typical" vehicle trip, the traveling factors (in grams/mile) can simply be divided by an estimate of average trip length (in miles/trip) for comparison to idle factors on an equivalent grams/trip basis.

Appendix B contains an excerpt of the AKMOBILE6 output file for the sample command input file provided in Appendix A. For page formatting purposes, only key columns (Run, Scenario, Description, Parameter, Units, ALL VEH, LDGV and LDGT1-4) are displayed.

###

4. SUMMARY OF PROGRAMMING IMPROVEMENTS

AKMOBILE6 contains a series of programming improvements over the original spreadsheet-based "hybrid" model that was used to calculate vehicle emissions in the recent Anchorage and Fairbanks CO SIP inventories. The primary programming improvements included: (1) conversion to an executable program; and (2) modification for use with MOBILE6. These improvements are summarized in this section.

4.1 Conversion to Executable Program

The most significant improvement from an ease-of-use perspective was the conversion of the thermal state tracking methodology from a combination of spreadsheet calculations and manually created MOBILE runs into a single executable program. This was accomplished by converting the thermal state calculations in the original spreadsheet into Fortran source code, developing curve-fitted equations to represent initial idling emissions from previous test measurements and utilizing the ability to run other programs from within the Fortran program during its execution.

As a result, AKMOBILE6 was written as a "shell" or driver program around EPA's as-released MOBILE6 model. AKMOBILE6 was designed to perform calculations of initial idling emission factors and then automatically execute MOBILE6 to compute after-idle traveling emission factors.

AKMOBILE6 was also made more user-friendly by employing an input command structure that essentially mimicked that of MOBILE6. Thus, MOBILE6 users will find it easy to adapt existing input command files to work with AKMOBILE6.

4.2 Use of MOBILE6

In concert with the conversion of the methodology to an executable program, the methodology was also updated to work with EPA's latest MOBILE6 emission factor model. The original methodology had been designed to work with MOBILE5b and the CO Emissions Model, predecessors to MOBILE6.

These earlier models used discrete operating mode fractions (i.e., fractions of vehicle operation in "cold start," "hot start," and "hot stabilized" modes as defined under the Federal Test Procedure) to reflect the degree a vehicle was warmed up and calculate "starting" emissions. In MOBILE6, the starting emissions methodology was significantly improved through the use of a continuous starting emissions curve as a function of prior soak time (instead of the discrete modes of the Federal Test Procedure). AKMOBILE6 was designed to work properly with the "continuous start" methodology in MOBILE6.

###

5. SUMMARY OF TECHNICAL IMPROVEMENTS

In addition to the programming changes, AKMOBILE6 contains a series of technical improvements over the original model that was used to calculate vehicle emissions in the recent Anchorage and Fairbanks CO SIP inventories. These improvements are discussed in this section.

5.1 Incorporation of Additional Test Data

The minute-by-minute warm-up idling emission rate tables in the original spreadsheet model were based upon cold start idle test measurements conducted on 111 vehicles (93 in Anchorage and 18 in Fairbanks) during the winter 1998-1999 testing program. In AKMOBILE6, these data were augmented with cold start idle measurements from an additional 25 vehicles tested in Fairbanks during a follow-on testing study[10] conducted in winter 2000-2001. Thus, the warm-up idle emission rates contained in AKMOBILE6 were based upon a total sample of 136 gasoline-powered cars and light-duty trucks.

Given this larger sample, warm-up idle emission rates in AKMOBILE6 were developed separately by vehicle type and model year range. Table 5-1 provides a breakdown of the resulting stratified sample sizes. (LDGV refers to passenger cars, LDGT to light-duty trucks.)

Table 5-1
AKMOBILE6 Warm-Up Idle Sample Sizes

Model Year Range	Vehicle Type		
	LDGV	LDGT	All
Pre-1988	14	10	24
1988-1993	35	20	55
Post-1993	41	16	57
All	90	47	136

5.2 Development of Warm-Up Idle Curves

The original spreadsheet model used look-up tables of minute-by-minute warm-up idle emission rates developed from test data. It could not be easily used to compute initial idling emissions for durations other than in whole minutes (e.g., a 1.5 minute idle event was treated as a 2-minute idle).

In AKMOBILE6, the broader sample of idle test data was fitted to a series of curves as a continuous function of initial idling time, enabling the model to calculate initial idling emissions for any duration. The curve fitting was performed on measurements of cumulative idle CO (in grams) at the end of each minute, tabulated by vehicle type and model year range. A series of segmented curve fits were developed using a combination of polynomial and linear equations as shown below:

$$
\begin{aligned}
E(t) &= a + bt + ct^2 \quad && \textit{for } t < t_0 \qquad && \text{(quadratic model)} \\
&= d + et && \textit{for } f \geq t_0 && \text{(linear model)}
\end{aligned}
$$

where $E(t)$ represents cumulative emissions at any time t (in minutes), t_0 is the transition point between the quadratic and linear segments of the curve and *a*, *b*, *c*, *d* and *e* are coefficients.

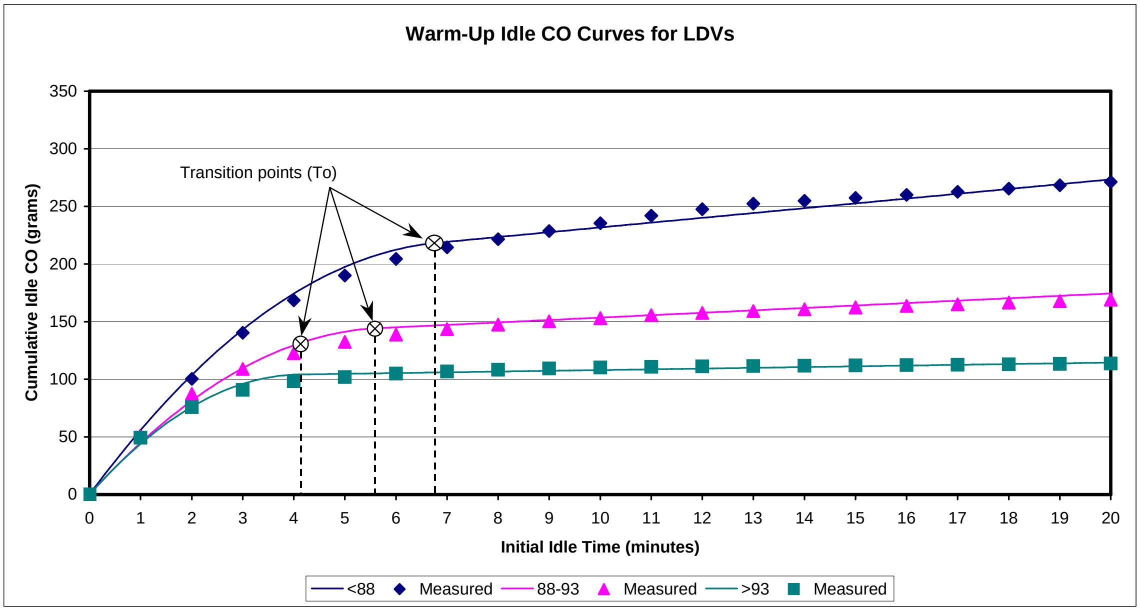
This segmented curve-fitting model was used since per-minute cold start idle emissions stabilize after a period between five and fifteen minutes depending on the vehicle; thus, cumulative idle emissions follow a linear trend after this stabilization time defined as t_0.

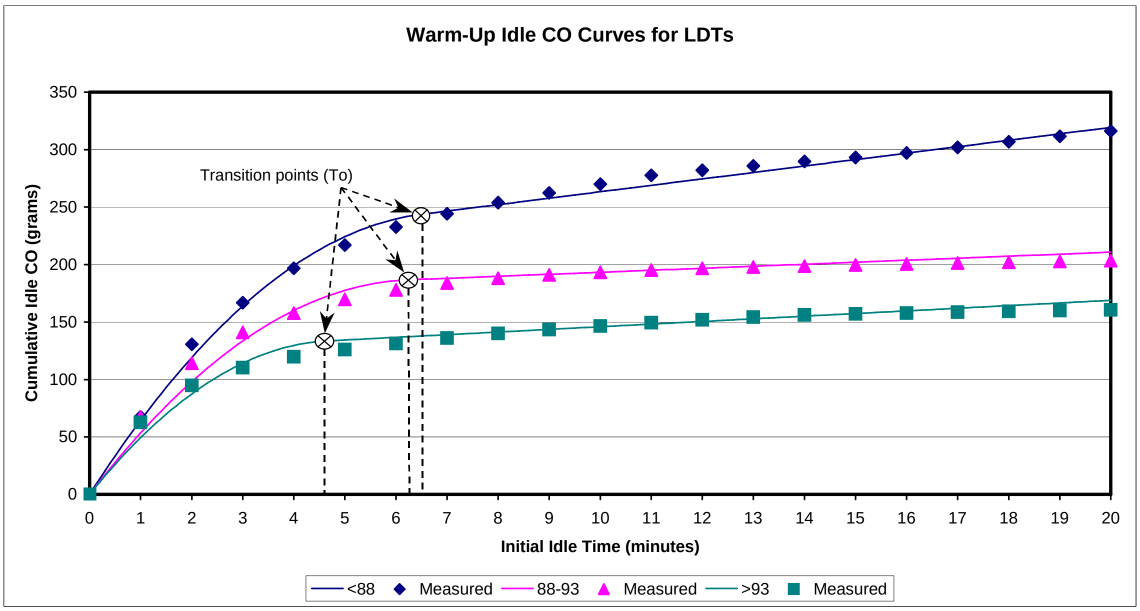
The *NLIN* library procedure in the SAS (Statistical Analysis Software) statistical software package was used to calculate optimized curve fits to the data.

Figure 5-1 shows the resulting series of fitted curves by vehicle type and model year range. For comparison purposes, measured values are also plotted in Figure 5-1 at each minute using specific symbols for each model year range curve.

As Figure 5-1 shows, the curves for each vehicle type and model year range combination fitted the measured data very closely; r^2 correlation coefficients exceeded 0.98 in all cases.

Figure 5-1
AKMOBILE6 Warm-Up Idle Cumulative CO Emission Curves





5.3 Incorporation of Idle Benefits from Oxygenated Fuels

AKMOBILE6 also includes logic to apply benefits from an oxygenated fuel program to initial idling emissions. This was accomplished by first applying a MOBILE6-derived factor of 1.175[*] to the Anchorage vehicle emission tests in the measured idle data. This converted the Anchorage test measurements (which were performed on oxygenate-fueled vehicles) to a "no oxy fuel" baseline. No adjustments were made to Fairbanks test data because they were not tested on oxygenated fuel.

Additional MOBILE6 runs (using Anchorage light-duty vehicle fleet registrations and mileage accumulation rates) for calendar years 1996 through 2020 were used to generate relative oxygenated fuel benefits (assuming 2.7% oxygenate) by calendar year and vehicle class. These relative benefits are shown below in Table 5-2.

Table 5-2
MOBILE6-Based Oxygenated Fuel Benefits

Calendar Year	Relative Oxygenated Fuel Benefit (%)				
	LDGV	LDGT1	LDGT2	LDGT3	LDGT4
1996	13.84%	17.07%	17.03%	16.91%	16.90%
1997	12.95%	15.91%	15.84%	15.92%	15.92%
1998	12.10%	14.89%	14.79%	15.01%	14.99%
1999	11.31%	14.32%	14.17%	14.01%	13.98%
2000	10.52%	13.48%	13.29%	13.23%	13.19%
2001	9.61%	12.50%	12.31%	12.46%	12.41%
2002	8.46%	11.18%	11.14%	11.59%	11.54%
2003	7.26%	9.99%	10.08%	11.17%	11.10%
2004	6.57%	9.05%	9.15%	10.37%	10.30%
2005	5.79%	7.07%	7.21%	8.34%	8.27%
2006	5.16%	6.41%	6.61%	7.55%	7.47%
2007	5.39%	6.68%	6.71%	7.21%	7.13%
2008	5.56%	7.07%	6.92%	7.15%	7.07%
2009	5.28%	6.67%	6.52%	6.74%	6.67%
2010	5.04%	6.21%	6.08%	6.27%	6.21%
2011	4.88%	5.62%	5.49%	5.71%	5.66%
2012	4.77%	5.24%	5.11%	5.25%	5.20%
2013	4.74%	5.13%	4.99%	5.09%	5.05%
2014	4.70%	5.05%	4.93%	4.99%	4.94%
2015	4.67%	4.98%	4.86%	4.89%	4.86%
2016	4.64%	4.91%	4.79%	4.82%	4.79%
2017	4.62%	4.86%	4.74%	4.75%	4.72%
2018	4.59%	4.68%	4.56%	4.69%	4.66%
2019	4.56%	4.56%	4.46%	4.62%	4.58%
2020	4.54%	4.51%	4.42%	4.40%	4.36%

[*] This factor was based on an "idle" reduction of 14.9% calculated using MOBILE6 for a calendar year 1999 Anchorage fleet using 2.7% oxygenated fuel, an FTP soak distribution, and a 2.5 mph speed and arterial facility type to simulate "idle" using MOBILE6. A 14.9% reduction translates to a multiplier of 1.175 (1÷(1-0.149)).

AKMOBILE6 was written to apply these relative benefits to idling emissions as a function of calendar year and vehicle class.

5.4 Better Representation of Plug-In Benefits

Inclusion of the test data from the winter 2000-2001study substantially increased the sample size of paired plug-in vs. no plug-in tests. Plug-in benefits in the original spreadsheet model were applied only to initial idling emissions (not after-idle traveling emissions), based on paired 20-minute warm-up idle tests. In addition, since paired tests were only available for six vehicles in the original 1998-1999 testing program, idle benefits were applied across all model years.

Use of the 2000-2001 study data increased the sample size of plug-in vs. no plug-in idle tests to 37 vehicles. Moreover, the additional 31 paired tests consisted of a 10-minute warm-up idle followed by the Alaska Driving Cycle (ADC), a transient stop-and-go driving cycle that represents wintertime driving patterns in Alaska as described in earlier Section 3. Thus, the effect of plugging in prior to a trip was measured during both the initial idle and traveling portion of the trip. Thus, AKMOBILE6 includes separate plug-in benefits for both initial idling and traveling, each of which is discussed separately below.

Plug-In Idle Emission Benefits - With the larger sample size, it was possible to develop estimates of plug-in idle benefits separately by model year range. These plug-in idle benefits are shown in Table 5-3. They were calculated by taking means of cumulative 10-minute warm-up idle emissions of paired tests (i.e., "with plug-in" and "no plug-in") in each model year range and computing the emission reduction percentage between the paired sample means.

Table 5-3
AKMOBILE6 Plug-In Idle CO Benefits (%) by Model Year Range

Model Year Range	Sample Size	Plug-In Benefit (%)
Pre-1988	4	74.8%
1988-1993	13	36.9%
Post-1993	20	52.2%

Although these benefits are somewhat lower than the 72% reduction applied across all model years in the original spreadsheet model, they are believed to be more reliable because they are based upon a much larger sample of measurements.

The individual paired tests in each model year range were also examined to identify reasons for the lower percentage benefits in the later model year ranges. Sierra identified 2-4 paired tests in the 1988-1993 and Post-1993 model year range groups that showed little changes or even a slight <u>increase</u> (less than 15%) in cumulative 10-minute idle emissions when plugged in. After some consideration, it was believed that these apparent anomalies could have been the result of faulty circuits in the heater plugs of those vehicles, making them unable to warm the engine block. (None of these instances were observed in the original six-vehicle sample.) These instances are likely to occur over a broader sample of the in-use fleet. Thus, a decision was made to retain these tests in the analysis sample in order to better represent <u>actual</u> in-use fleet plug-in benefits. Hence, the plug-in idle benefits in AKMOBILE6 reflect the fact that some vehicles, despite plugging in, get little or no benefits because of a non-working plug-in connection.

Statistical T-tests were also conducted on the data in each model year range group to determine the statistical significance of the mean benefits of each group. In all cases of pooled T-test comparisons between each of the three groups, the differences in mean benefits in each group were statically significant (at 95% probability or greater). Thus, the separate benefits by model year range shown in Table 5.3 were included in AKMOBILE6, rather than averaged together across all model years.

In this version of AKMOBILE6 (Version 1.10E), a correction was also applied to the logic contained in preceding versions for calculating plug-in idle emissions to reflect the initial thermal state (based on the soak time input). In earlier versions of the model, plug-in idle emissions were calculated solely based on the relative benefits shown in Table 5-3. Since the relative benefits in Table 5-3 were based on fully cold test data (thermal state = 1.0), they reflected plug-in idling reductions <u>only under cold-start conditions</u>. In this version of the model, a correction term was included in the plug-in idle equation that also scaled the benefits in Table 5-3 by the thermal state. For a cold start, the relative plug-in idle benefits were exactly as in Table 5-3; for a hot start (thermal state = 0.0), they were assumed to be zero. This plug-in scaling factor was then linearly interpolated between fully cold and hot based on the initial thermal state. (For analysis scenarios that assume the vehicle is not fully cold when started, this corrected version of AKMOBILE6 will exhibit slightly higher initial idling emissions than earlier versions.)

<u>Plug-In Traveling Emission Benefits</u> – In addition to the warm-up idle, transient emissions measured over the subsequent stop-and-go ADC cycle with and without prior plug-in were used to develop a separate estimate of plug-in benefits for the remaining <u>traveling</u> portion of a vehicle trip that follows initial idling.

Since ADC tests were only available from the more recent 2000-2001 testing program and several ADC tests were invalidated (e.g., due to driving outside the driving trace) in the paired plug-in vs. no plug-in testing, a total of 26 valid paired tests were available for this analysis, with only a single vehicle from the Pre-1988 model year range. Thus, although similar approach to that employed in calculating plug-in idle benefits was used, plug-in traveling benefits were computed by combining the available data across all model year ranges.

Mean ADC emissions from all paired tests with and without plug-in tests were computed as 72.2 grams and 57.5 grams for without plug-in and with plug-in tests, respectively. The percentage reduction in traveling emissions from plug-ins was then calculated from these paired means as 20.4% (i.e., [72.2-57.5]÷72.2). Thus, AKMOBILE6 includes a 20.4% traveling emissions benefit for plug-ins.

5.5 Separation of Idle and Transient Warm-Up Effects

Another key improvement consisted of using separate relationships to translate the thermal state (the degree of warm-up) to initial idle emission rates and after-idle traveling emission rates that reflect transient (stop-and-go) driving.

The broader sample of Alaska emission test data available during the development of AKMOBILE6 also included some measurements of initial idling after shorter soak periods than the 12-hour soak period for the “cold start” idle tests. These “shorter soak” idle measurements were collected as part of the mid-trip idle testing in the winter 2000-2001 study and included soaks of 20, 40, 60, and 120 minutes.

The winter 2000-2001 testing program also included emissions measurements over the Alaska Driving Cycle (ADC), a transient stop-and-go driving cycle that represents wintertime driving patterns in Alaska as described in earlier Section 3. These ADC test measurements were also preceded by soak times of 20, 40, 60 and 120 minutes and “overnight” (i.e., 12 hours). A series of ADC tests were also run after initial idling periods of 2, 5, 10 and 15 minutes.

These sets of measurements from the 2000-2001 testing program were available for 34 individual vehicles.

The original spreadsheet model used empirical relationships of engine coolant temperature during warm-up idling and engine-off “cool-down” soaks developed from instrumented vehicle measurements[11] to determine a vehicle’s thermal state after varying periods of soak and initial idling. In the original model, these coolant temperature relationships were used to determine both initial idle and after-idle traveling emissions.

These coolant temperature-based equations were used to model initial idling emissions in AKMOBILE6. However, analysis of the 2000-2001 testing program data revealed that although idle emission rates may stabilize after several minutes of initial idling, after-idle transient emissions indicate the vehicle is not fully warmed up.

This finding led to the use of a different relationship (than based on coolant temperature) for determining a vehicle’s thermal state after initial idling and modeling after-idle traveling emissions during transient driving.

Both the initial idling and after-idle traveling emission methodologies are described below.

Initial Idling Emissions – The coolant temperature cool-down equation used in the original spreadsheet model and documented in the Fairbanks SIP inventory[4] was also applied within AKMOBILE6 to calculate the degree a vehicle cools down as a function of soak time and ambient temperature. This cool-down equation representing coolant temperature T_C as a function of these variables is shown below:

$$T_C = T_A + (T_{C0} - T_{A0}) \times \exp(\frac{A}{D} \times t_{soak})$$

where T_C = coolant temperature (°C),
T_A = ambient temperature (°C),
T_{C0} = initial coolant temperature at start of soak (°C),
T_{A0} = initial ambient temperature at start of soak (°C),
A = -1.039 liters/hour (a constant),
D = engine size (liters), and
t_{soak} = soak time (hours).

In AKMOBILE6, a vehicle was assumed to be fully-warmed up at the start of the soak (i.e., at the end of the preceding trip). Thus, a constant value of 88°C (190°F) was assumed for T_{C0}. This value corresponds to a typical thermostat "set point" (i.e., the maximum coolant temperature as controlled by the thermostat). A constant value of *D* of 2.7 liters was also assumed based on the average engine size of vehicle in the combined 1998-1999 and 2000-2001 light-duty vehicle test fleets. Finally, the ambient temperature at the start of the soak T_{A0} was assumed to equal the ambient temperature at the end of the soak T_A. Thus, the above equation was simplified to compute coolant temperature T_C as a function of ambient temperature T_A and soak time t_{soak}.

As in the original spreadsheet model, the coolant temperature after cool-down was used to calculate the initial thermal state (TS_I) prior to initial idling. Soak times of 12 hours or more reflect a TS_I of 1 (fully cold). Soak times of 10 minutes or less represent a fully warmed-up thermal state ($TS_I = 0$). Between these extremes, TS_I was calculated from coolant temperature T_C and ambient temperature T_A as follows:

$$TS_I = \frac{88 - T_C}{88 - T_A}$$

The initial thermal state TS_I was then used to locate the "start point" on the cumulative warm-up idle emission curves by vehicle type and model year shown earlier in Figure 4-1. Since a TSI of zero reflects fully warmed-up or stabilized idle emissions, values greater than zero were scaled off the idle stabilization time to determine the start point for computing idle emissions. For example, assuming an idle stabilization time t_0

of 10 minutes for a specific curve, a TS_I of 0.8 (representing a "mostly cold" soak) indicated that the start point on the cumulative idle curve was 8 minutes (10 × 0.8). For a given idling duration, AKMOBILE6 then calculates initial idling emissions as the difference between the starting and ending points on the cumulative emission curve. Continuing with the earlier example, for an idle duration of 5 minutes, emissions would be computed from the difference between the values at 8 and 13 minutes on the curve.

After-Idle Transient Emissions – The 2000-2001 test measurements clearly showed that stabilization of initial idle emissions was not always indicative of a vehicle being fully warmed-up when subsequently tested over the ADC transient driving cycle. This was seen by comparing emissions measured over the ADC (not including preceding initial idle) for vehicles tested after overnight soaks and either zero, 2, 5, 10 or 15 minutes of initial idling followed immediately by an ADC against test sequences where back-to-back ADCs were run (and assumed to represent fully warmed transient emissions).

Figure 5-2 presents these results, which were based on measurements over each test sequence from 33 vehicles. The test sequences referred to as Cold-*x* are those that were soaked overnight and then tested with varying idle periods, followed immediately by an ADC, where *x* is the idling time in minutes. The "Hot" test sequence refers to the emissions measured over the second of back-to-back ADCs.

Figure 5-2
Comparison of Measured ADC CO Emissions by Test Sequence

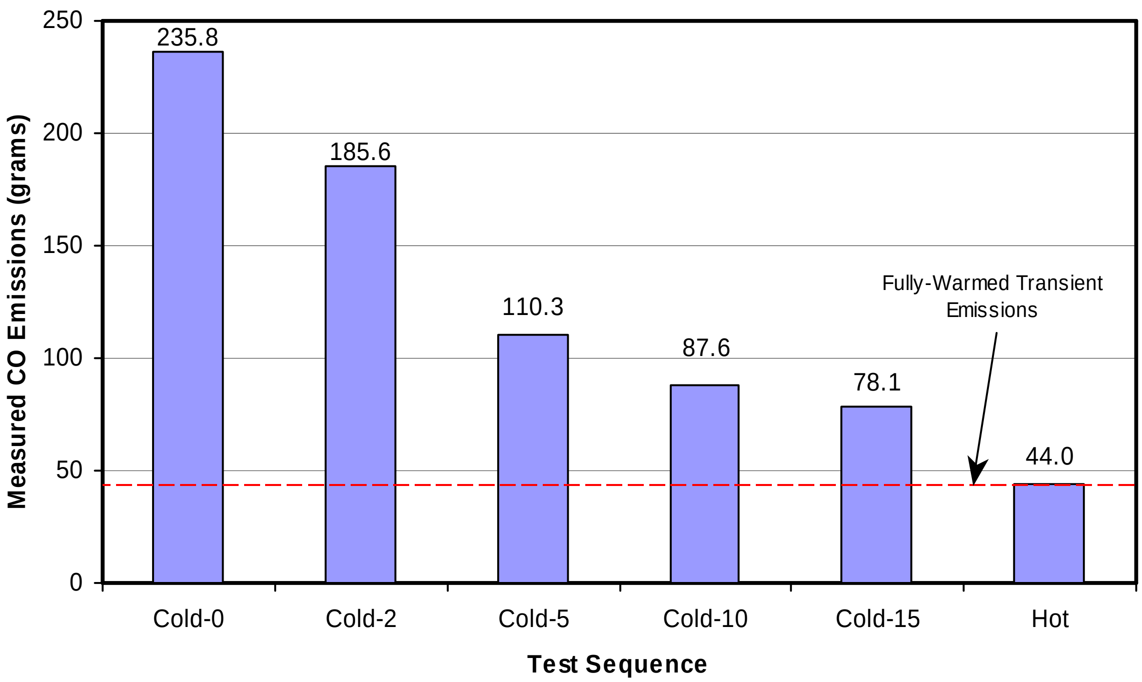
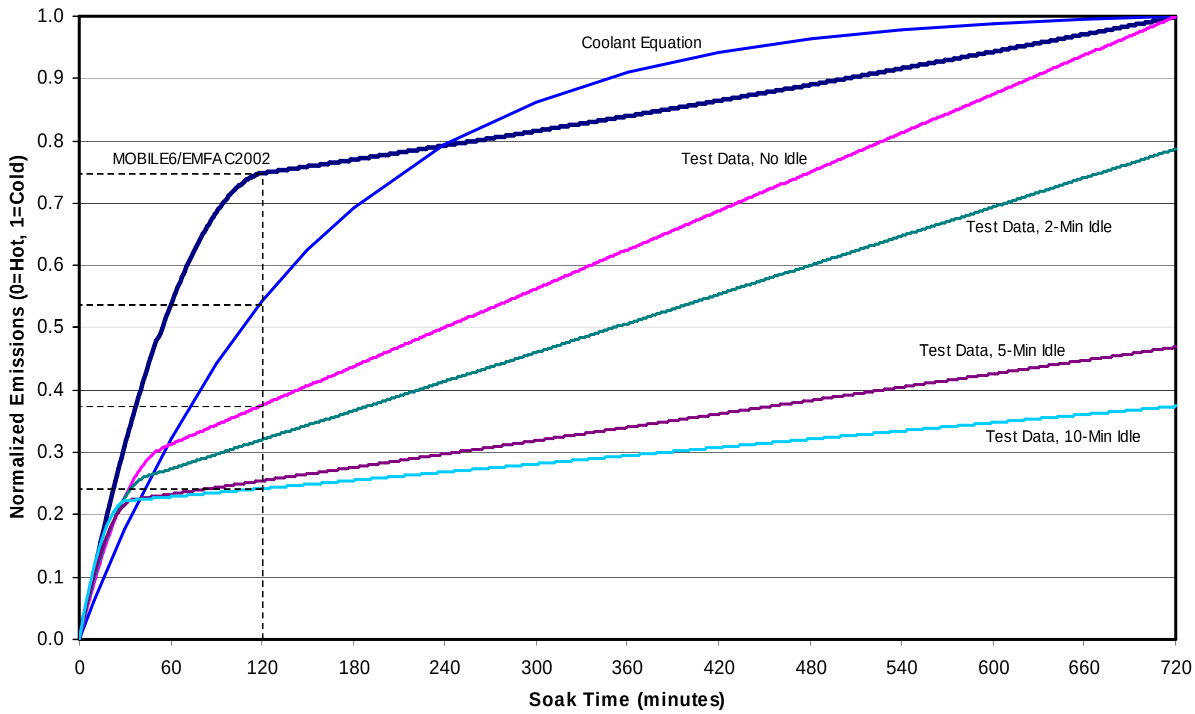


Figure 5-2 clearly shows that even after 15 minutes of initial idling (by which time all vehicles exhibit stabilized idle emission rates), subsequently measured transient emissions do not reflect complete warm-up, as indicated by the fact that the “Cold-15” emissions are nearly double that of the “Hot” emissions.

Using the emissions measurements over these test sequences as well as those for test sequences of ADCs with no preceding idle following 20-, 40-, 60-, and 120-minute soaks, a family of curves was developed to represent “normalized” (i.e., relative) transient emissions as a function of preceding soak and initial idle time. These measured transient emissions were normalized relative to fully warm (1-minute soak) and cold (720-minute soak) transient emission tests. Thus, they reflect an “after-idle” thermal state and vary between 0 (fully warm) and 1 (fully cold).

The curves were developed using the same quadratic/linear segmented model forms developed for warm-up idle emissions and optimally fitted to the test data using the NLIN library procedure in SAS. Figure 5-3 displays this family of normalized emission curves and compares them to normalized emissions based on the aforementioned coolant temperature equation and the soak curve used in MOBILE6 to calculate incremental starting emissions.

Figure 5-3



As Figure 5-3 shows, comparison of the test measurement-based curves show that initial idling has some effect on subsequent transient emissions. However, for significant soak periods of 12 hours (720 minutes) or more, even after initial idling events up to 15 minutes, normalized emissions are still roughly 40% of the difference between hot and cold transient levels.

Figure 5-3 also shows that these relationships differ significantly from those modeled using either the coolant equation or the soak curve in MOBILE6, as highlighted by a comparison of normalized emissions after a 120-minute soak indicated with dashed lines. The Alaska test data-based curves indicate that normalized transient emissions are lower than modeled by MOBILE6.

This may seem counterintuitive since the engine and catalyst cool quicker in colder Alaskan temperatures that at the standard conditions reflected in the MOBILE6 curve. However, an explanation can be given from consideration of the coolant temperature equation, which predicts coolant temperature as a function of cool-down (i.e., soak) time in conjunction with the ambient temperature. This explanation is presented by example below.

The MOBILE6 soak curve is based on emissions measurements at ambient temperatures that average roughly 75°F. On the other hand, the average ambient temperature for the Alaska test measurements was approximately 10°F. Using the coolant equation, a 120-minute soak will result in cool-down (from a warmed-up temperature of 190°F) to 128°F at an ambient temperature of 75°F, which is 53°F over ambient. This translates to a thermal state of 0.55 ([190-128]/[190-75]). However, at an ambient temperature of only 10°F, a 120-minute cool-down will result in a coolant temperature of 94°F, which is still 84°F over ambient, and a thermal state of 0.53. Thus, at colder ambient temperatures the engine (and presumably the catalyst) is still much warmer than the surrounding temperature than is the case under warmer ambient conditions. This explains how transient emissions after a specific soak period may be lower on a relative basis in colder climates such as Alaska. However, absolute emissions (i.e., in grams) are still higher at colder temperatures.

5.6 Use of MOBILE6-Based Technology Forecasts for Idle

The measured initial idling emissions from the Alaska testing programs represent a "snapshot" in idle emission levels that existed in the vehicle fleet at the time testing was conducted. In future calendar years, initial idling emission levels of the vehicle fleet are expected to be lower than those tested in the 2000 timeframe due to continuing emission control technology improvements. Thus, it was necessary to include an element in AKMOBILE6 that accounted for the combined effects of technology improvements and fleet turnover in estimating initial idle emission levels for calendar years beyond 2000.

Future year idle emissions in AKMOBILE6 were modeled using a series scaling factors based on outputs from MOBILE6. The basic emission rate equations in MOBILE6 include the effects of in-use emissions deterioration and improvements from introduction of cleaner technologies in future model years. Although MOBILE6 cannot generate actual idle emission factors, the model was run using the following input parameters to simulate cold start “idle” per EPA guidance:

- 2.5 mph vehicle speed,
- 100% arterial travel,
- Cold start (100% operation with 12-hour soak), and
- No I/M (the eliminate the effect of I/M in determining idle ratios).

Using Alaska-specific mileage accumulation rates and registration distributions, a series of MOBILE6 runs were generated by calendar year for calendar years 2000 through 2020. Scaling factors for future calendar years after 2000 were developed for each light-duty gasoline vehicle class from these outputs. The scaling factors were normalized to a 2000 “base” year.

Table 5-4 shows these MOBILE6-based ratios. They were incorporated into AKMOBILE6 and used to determine initial idle emission factors by vehicle class for calendar years from 2001 through 2020. This was done by scaling the calendar year 2000-based idle emissions calculated earlier in AKMOBILE6 as a function of soak time, initial idle time and temperature with vehicle class-specific factors for the future calendar year being modeled.

For example, assume an input calendar year of 2005 and a trip scenario characterized by a 12-hour soak and 3 minutes of initial idle. Further assume the “base” idle emissions for LDGVs under this trip scenario calculated within AKMOBILE6 from the 2000 fleet-based warm-up curves was 90 grams/trip of CO. Using the scaling factors as shown in Table 5-4, AKMOBILE computes calendar year 2005 idle emissions for LDGVs under this trip scenario as 64.3 grams/trip (90×0.748).

Table 5-4
MOBILE6-Based Future Year Idle Scaling Factors

Calendar Year	Idle Ratios By Vehicle Class				
	LDGV	LDGT1	LDGT2	LDGT3	LDGT4
2000	1.000	1.000	1.000	1.000	1.000
2001	0.944	0.933	0.933	0.929	0.930
2002	0.898	0.878	0.872	0.860	0.861
2003	0.864	0.827	0.816	0.753	0.755
2004	0.761	0.749	0.737	0.684	0.686
2005	0.748	0.685	0.671	0.625	0.628
2006	0.743	0.656	0.639	0.593	0.595
2007	0.640	0.570	0.563	0.532	0.534
2008	0.582	0.498	0.499	0.481	0.483
2009	0.563	0.468	0.469	0.451	0.453
2010	0.543	0.434	0.434	0.417	0.419
2011	0.523	0.404	0.404	0.389	0.391
2012	0.505	0.373	0.373	0.359	0.362
2013	0.495	0.356	0.355	0.341	0.344
2014	0.485	0.344	0.343	0.328	0.330
2015	0.477	0.334	0.332	0.317	0.319
2016	0.469	0.321	0.319	0.304	0.306
2017	0.462	0.313	0.311	0.296	0.298
2018	0.456	0.302	0.300	0.286	0.288
2019	0.451	0.295	0.293	0.278	0.280
2020	0.448	0.290	0.288	0.273	0.275

###

6. REFERENCES

1. “Winter 1997-98 Anchorage Carbon Monoxide Saturation Monitoring Study,” Municipality of Anchorage, August 1998.

2. “Analysis of Alaska Vehicle CO Emission Study Data,” prepared by Sierra Research for the Municipality of Anchorage, Report No. SR-00-02-01, February 3, 2000.

3. Cold Temperature Driving Cycle Development and Emission Testing, Contract No. 18-4002-00.

4. “Fairbanks 1995-2001 Carbon Monoxide Emission Inventory,” Report No. SR01-07-04, Prepared for the Fairbanks North Star Borough, by Sierra Research, July 24, 2001.

5. “Anchorage Carbon Monoxide Emissions Inventory and Year 2000 Attainment Projections,” Municipality of Anchorage, Air Quality Program, Environmental Services Division, Department of Health and Human Services, September 2001.

6. “Approval and Promulgation of State Implementation Plans; State of Alaska; Fairbanks,” Federal Register Notice, Volume 67, No. 23, February 4, 2002.

7. “Approval and Promulgation of Carbon Monoxide Implementation Plan; State of Alaska, Anchorage,” Federal Register Notice, Volume 67, No. 181, September 12, 2002.

8. “User’s Guide to MOBILE6.1 and MOBILE6.2 Mobile Source Emission Factor Model,” Assessment and Standards Division, Office of Transportation and Air Quality, U.S. Environmental Protection Agency, Report No. EPA420-R-02-028, October 2002.

9. Cold Temperature Driving Cycle Development and Emission Testing, Contract No. 18-4002-00.

10. Sierra Research, Inc., “Fairbanks Cold Temperature Vehicle Testing: Warmup Idle, Between-trip Idle and Plug-In,” prepared for the Alaska Department of Environmental Conservation, Report No. SR01-07-01B, July 2001.

11. Kishan, S. and T. H. DeFries, “Light-Duty Vehicle Driving Behavior: Evaluation of Trip Start Activity,” prepared for Sierra Research under contract to the U.S. Environmental Protection Agency by Radian Corporation, June 23, 1993.

APPENDIX A

AKMOBILE6 Sample Command Input File

```
****************************************************************
* Anchorage Test Run #1 for AKMOBILE6 Development
*
* 1 Run section, 144 scenarios (16 soaks x 9 idle/plug combos)
****************************************************************

MOBILE6 INPUT FILE :
POLLUTANTS         : CO
SPREADSHEET        :
RUN DATA           :

EXPAND EXHAUST     :
MIN/MAX TEMP       : 20.0 20.0
FUEL RVP           : 14.7
REG DIST           : anc_reg.prn
MILE ACCUM RATE    : anc_mar.prn
VMT FRACTIONS      :
0.6890 0.0511 0.1699 0.0349 0.0161 0.0127 0.0013 0.0009
0.0007 0.0027 0.0033 0.0036 0.0129 0.0006 0.0003 0.0000
ANTI-TAMP PROG     :
85 75 20 22222 22211111 2 12 090. 22112221

FUEL PROGRAM       : 3
OXYGENATED FUELS   : 0.000 1.000 0.000 0.027 1

I/M PROGRAM        : 1 1985 2000 2 TRC 2500/IDLE
I/M MODEL YEARS    : 1 1968 2020
I/M VEHICLES       : 1 22222 22211111 2
I/M STRINGENCY     : 1 23.0
I/M COMPLIANCE     : 1 90.0
I/M WAIVER RATES   : 1 0.0 0.0
I/M EFFECTIVENESS  : 0.85 0.85 0.00

I/M PROGRAM        : 2 2001 2020 2 TRC 2500/IDLE
I/M MODEL YEARS    : 2 1968 1995
I/M VEHICLES       : 2 22222 22211111 2
I/M STRINGENCY     : 2 23.0
I/M COMPLIANCE     : 2 90.0
I/M WAIVER RATES   : 2 0.0 0.0
I/M EFFECTIVENESS  : 0.85 0.85 0.00

> I/M Program -- OBD Testing for MY96+ in 2001+
I/M PROGRAM        : 3 2001 2020 2 TRC OBD I/M
I/M MODEL YEARS    : 3 1996 2020
I/M VEHICLES       : 3 22222 22211111 2
I/M STRINGENCY     : 3 23.0
I/M COMPLIANCE     : 3 93.0
I/M WAIVER RATES   : 3 0.0 0.0

***********************     No Idle, W/ Plug In    *********************

SCENARIO RECORD    : CY2000, SoakHrs=12, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 12, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=11, Idle=0, Plug=1, 20 mph, Arterial
```

```
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 11, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=10, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 10, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=9, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 9, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=8, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 8, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=7, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 7, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=6, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 6, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=5, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 5, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=4, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 4, 0, 1
NO SFTP SPEED      :
```

```
SCENARIO RECORD    : CY2000, SoakHrs=3, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 3, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=2, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 2, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=1, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 1, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.5, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.5, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.1667, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.1667, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.10, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.10, 0, 1
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.017, Idle=0, Plug=1, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.017, 0, 1
NO SFTP SPEED      :
**********************     No Idle, No Plug In   *********************

SCENARIO RECORD    : CY2000, SoakHrs=12, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 12, 0, 0
```

```
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=11, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 11, 0, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=10, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 10, 0, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=9, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 9, 0, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=8, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 8, 0, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=7, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 7, 0, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=6, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 6, 0, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=5, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 5, 0, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=4, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
```

```
> INITIAL IDLE      : S, 4, 0, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=3, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 3, 0, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=2, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 2, 0, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=1, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 1, 0, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.5, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.5, 0, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.1667, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.1667, 0, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.10, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.10, 0, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.017, Idle=0, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.017, 0, 0
NO SFTP SPEED       :

***********************     1-min Idle, No Plug In   *********************

SCENARIO RECORD     : CY2000, SoakHrs=12, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
```

```
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 12, 1, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=11, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 11, 1, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=10, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 10, 1, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=9, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 9, 1, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=8, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 8, 1, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=7, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 7, 1, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=6, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 6, 1, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=5, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 5, 1, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=4, Idle=1, Plug=0, 20 mph, Arterial
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```
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 4, 1, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=3, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 3, 1, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=2, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 2, 1, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=1, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 1, 1, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.5, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.5, 1, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.1667, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.1667, 1, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.10, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.10, 1, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.017, Idle=1, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.017, 1, 0
NO SFTP SPEED       :
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```
**********************     2-min Idle, No Plug In   ********************

SCENARIO RECORD    : CY2000, SoakHrs=12, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 12, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=11, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 11, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=10, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 10, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=9, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 9, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=8, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 8, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=7, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 7, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=6, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 6, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=5, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
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```
> INITIAL IDLE     : S, 5, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=4, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 4, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=3, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 3, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=2, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 2, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=1, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 1, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.5, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.5, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.1667, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.1667, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.10, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.10, 2, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.017, Idle=2, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
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SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.017, 2, 0
NO SFTP SPEED      :

**********************     3-min Idle, No Plug In   ********************

SCENARIO RECORD    : CY2000, SoakHrs=12, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 12, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=11, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 11, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=10, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 10, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=9, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 9, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=8, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 8, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=7, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 7, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=6, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 6, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=5, Idle=3, Plug=0, 20 mph, Arterial
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```
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 5, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=4, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 4, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=3, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 3, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=2, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 2, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=1, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 1, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.5, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.5, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.1667, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.1667, 3, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.10, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.10, 3, 0
NO SFTP SPEED      :
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SCENARIO RECORD    : CY2000, SoakHrs=0.017, Idle=3, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.017, 3, 0
NO SFTP SPEED      :

***********************     5-min Idle, No Plug In   *********************

SCENARIO RECORD    : CY2000, SoakHrs=12, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 12, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=11, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 11, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=10, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 10, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=9, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 9, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=8, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 8, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=7, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 7, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=6, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
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> INITIAL IDLE      : S, 6, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=5, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 5, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=4, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 4, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=3, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 3, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=2, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 2, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=1, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 1, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.5, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.5, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.1667, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.1667, 5, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.10, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
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SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.10, 5, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.017, Idle=5, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.017, 5, 0
NO SFTP SPEED      :

***********************    10-min Idle, No Plug In   *********************

SCENARIO RECORD    : CY2000, SoakHrs=12, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 12, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=11, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 11, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=10, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 10, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=9, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 9, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=8, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 8, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=7, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 7, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=6, Idle=10, Plug=0, 20 mph, Arterial
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```
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 6, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=5, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 5, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=4, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 4, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=3, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 3, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=2, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 2, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=1, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 1, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.5, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.5, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.1667, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.1667, 10, 0
NO SFTP SPEED      :
```

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SCENARIO RECORD    : CY2000, SoakHrs=0.10, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.10, 10, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.017, Idle=10, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.017, 10, 0
NO SFTP SPEED      :

***********************    15-min Idle, No Plug In   *********************

SCENARIO RECORD    : CY2000, SoakHrs=12, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 12, 15, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=11, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 11, 15, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=10, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 10, 15, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=9, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 9, 15, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=8, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 8, 15, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=7, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
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```
> INITIAL IDLE      : S, 7, 15, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=6, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 6, 15, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=5, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 5, 15, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=4, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 4, 15, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=3, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 3, 15, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=2, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 2, 15, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=1, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 1, 15, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.5, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.5, 15, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.1667, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
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SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.1667, 15, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.10, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.10, 15, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.017, Idle=15, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.017, 15, 0
NO SFTP SPEED      :

***********************    20-min Idle, No Plug In   *********************

SCENARIO RECORD    : CY2000, SoakHrs=12, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 12, 1, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=11, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 11, 20, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=10, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 10, 20, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=9, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 9, 20, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=8, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 8, 20, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=7, Idle=20, Plug=0, 20 mph, Arterial
```

```
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 7, 20, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=6, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 6, 20, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=5, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 5, 20, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=4, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 4, 20, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=3, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 3, 20, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=2, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 2, 20, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=1, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 1, 20, 0
NO SFTP SPEED       :

SCENARIO RECORD     : CY2000, SoakHrs=0.5, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR       : 2000
EVALUATION MONTH    : 1
AVERAGE SPEED       : 20.0 Arterial
SOAK DISTRIBUTION   : Soakdst.cld
> INITIAL IDLE      : S, 0.5, 20, 0
NO SFTP SPEED       :
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SCENARIO RECORD    : CY2000, SoakHrs=0.1667, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.1667, 20, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.10, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.10, 20, 0
NO SFTP SPEED      :

SCENARIO RECORD    : CY2000, SoakHrs=0.017, Idle=20, Plug=0, 20 mph, Arterial
CALENDAR YEAR      : 2000
EVALUATION MONTH   : 1
AVERAGE SPEED      : 20.0 Arterial
SOAK DISTRIBUTION  : Soakdst.cld
> INITIAL IDLE     : S, 0.017, 20, 0
NO SFTP SPEED      :

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END OF RUN         :
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APPENDIX B

AKMOBILE6 Sample Output File

Run	Scenario	Description	CY	Parameter	Units	ALL VEH	LDGV	LDGT1	LDGT2	LDGT3	LDGT4
1	1	CY2000, SoakHrs=12, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	1	CY2000, SoakHrs=12, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	1	CY2000, SoakHrs=12, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	40.567	37.029	52.97	53.632	54.873	55.159
1	2	CY2000, SoakHrs=11, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	2	CY2000, SoakHrs=11, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	2	CY2000, SoakHrs=11, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	38.404	35.271	49.66	50.337	50.401	50.692
1	3	CY2000, SoakHrs=10, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	3	CY2000, SoakHrs=10, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	3	CY2000, SoakHrs=10, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	38.404	35.271	49.66	50.337	50.401	50.692
1	4	CY2000, SoakHrs=9, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	4	CY2000, SoakHrs=9, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	4	CY2000, SoakHrs=9, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	5	CY2000, SoakHrs=8, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	5	CY2000, SoakHrs=8, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	5	CY2000, SoakHrs=8, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	6	CY2000, SoakHrs=7, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	6	CY2000, SoakHrs=7, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	6	CY2000, SoakHrs=7, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	7	CY2000, SoakHrs=6, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	7	CY2000, SoakHrs=6, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	7	CY2000, SoakHrs=6, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	29.018	26.63	37.127	37.577	37.782	38.005
1	8	CY2000, SoakHrs=5, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	8	CY2000, SoakHrs=5, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	8	CY2000, SoakHrs=5, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	27.426	25.148	35.026	35.434	35.777	35.988
1	9	CY2000, SoakHrs=4, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	9	CY2000, SoakHrs=4, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	9	CY2000, SoakHrs=4, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	25.715	23.552	32.769	33.131	33.627	33.825
1	10	CY2000, SoakHrs=3, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	10	CY2000, SoakHrs=3, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	10	CY2000, SoakHrs=3, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.883	21.844	30.356	30.669	31.332	31.515
1	11	CY2000, SoakHrs=2, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	11	CY2000, SoakHrs=2, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	11	CY2000, SoakHrs=2, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.595	19.709	27.344	27.595	28.47	28.634
1	12	CY2000, SoakHrs=1, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	12	CY2000, SoakHrs=1, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	12	CY2000, SoakHrs=1, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.861	18.09	25.064	25.268	26.303	26.453
1	13	CY2000, SoakHrs=0.5, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	13	CY2000, SoakHrs=0.5, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	13	CY2000, SoakHrs=0.5, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	17.295	15.694	21.692	21.825	23.096	23.225
1	14	CY2000, SoakHrs=0.1667, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	14	CY2000, SoakHrs=0.1667, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	14	CY2000, SoakHrs=0.1667, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	13.379	12.034	16.553	16.577	18.213	18.31
1	15	CY2000, SoakHrs=0.10, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	15	CY2000, SoakHrs=0.10, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	15	CY2000, SoakHrs=0.10, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	12.138	10.873	14.925	14.915	16.672	16.758
1	16	CY2000, SoakHrs=0.017, Idle=0, Plug=1, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	16	CY2000, SoakHrs=0.017, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	16	CY2000, SoakHrs=0.017, Idle=0, Plug=1, 20 mph, Arterial	2000	CO-Trav	(g/mile)	10.842	9.662	13.227	13.18	15.062	15.138
1	17	CY2000, SoakHrs=12, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	17	CY2000, SoakHrs=12, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	17	CY2000, SoakHrs=12, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	47.888	43	64.336	64.914	69.122	69.382
1	18	CY2000, SoakHrs=11, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	18	CY2000, SoakHrs=11, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	18	CY2000, SoakHrs=11, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	45.874	41.324	61.194	61.801	65.69	65.959
1	19	CY2000, SoakHrs=10, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	19	CY2000, SoakHrs=10, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	19	CY2000, SoakHrs=10, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	43.397	39.308	57.342	57.978	60.836	61.114
1	20	CY2000, SoakHrs=9, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	20	CY2000, SoakHrs=9, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	20	CY2000, SoakHrs=9, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	41.024	37.397	53.673	54.331	55.843	56.127
1	21	CY2000, SoakHrs=8, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	21	CY2000, SoakHrs=8, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	21	CY2000, SoakHrs=8, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	38.819	35.612	50.293	50.967	51.232	51.521
1	22	CY2000, SoakHrs=7, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	22	CY2000, SoakHrs=7, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	22	CY2000, SoakHrs=7, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	38.404	35.271	49.66	50.337	50.401	50.692
1	23	CY2000, SoakHrs=6, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	23	CY2000, SoakHrs=6, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	23	CY2000, SoakHrs=6, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	24	CY2000, SoakHrs=5, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	24	CY2000, SoakHrs=5, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	24	CY2000, SoakHrs=5, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087

Run	Scenario	Description	CY	Parameter	Units	ALL VEH	LDGV	LDGT1	LDGT2	LDGT3	LDGT4
1	25	CY2000, SoakHrs=4, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	25	CY2000, SoakHrs=4, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	25	CY2000, SoakHrs=4, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	29.521	27.098	37.793	38.256	38.418	38.645
1	26	CY2000, SoakHrs=3, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	26	CY2000, SoakHrs=3, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	26	CY2000, SoakHrs=3, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	26.869	24.628	34.291	34.684	35.077	35.283
1	27	CY2000, SoakHrs=2, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	27	CY2000, SoakHrs=2, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	27	CY2000, SoakHrs=2, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	24.507	22.426	31.177	31.507	32.114	32.301
1	28	CY2000, SoakHrs=1, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	28	CY2000, SoakHrs=1, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	28	CY2000, SoakHrs=1, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	22.595	20.642	28.661	28.939	29.721	29.893
1	29	CY2000, SoakHrs=0.5, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	29	CY2000, SoakHrs=0.5, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	29	CY2000, SoakHrs=0.5, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.144	17.421	24.122	24.306	25.407	25.551
1	30	CY2000, SoakHrs=0.1667, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	30	CY2000, SoakHrs=0.1667, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	30	CY2000, SoakHrs=0.1667, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	14.177	12.781	17.6	17.646	19.204	19.307
1	31	CY2000, SoakHrs=0.10, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	31	CY2000, SoakHrs=0.10, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	31	CY2000, SoakHrs=0.10, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	12.558	11.266	15.475	15.477	17.193	17.283
1	32	CY2000, SoakHrs=0.017, Idle=0, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	32	CY2000, SoakHrs=0.017, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	0	0	0	0	0	0
1	32	CY2000, SoakHrs=0.017, Idle=0, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	10.842	9.662	13.227	13.18	15.062	15.138
1	33	CY2000, SoakHrs=12, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	33	CY2000, SoakHrs=12, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	41.24	39.521	45.603	45.603	45.603	45.603
1	33	CY2000, SoakHrs=12, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	44.379	40.103	58.867	59.492	62.824	63.098
1	34	CY2000, SoakHrs=11, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	34	CY2000, SoakHrs=11, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	41.032	39.318	45.379	45.379	45.379	45.379
1	34	CY2000, SoakHrs=11, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	42.431	38.53	55.846	56.492	58.826	59.107
1	35	CY2000, SoakHrs=10, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	35	CY2000, SoakHrs=10, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	40.725	39.021	45.05	45.05	45.05	45.05
1	35	CY2000, SoakHrs=10, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	40.118	36.667	52.28	52.945	53.923	54.21
1	36	CY2000, SoakHrs=9, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	36	CY2000, SoakHrs=9, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	40.275	38.584	44.566	44.566	44.566	44.566
1	36	CY2000, SoakHrs=9, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	38.404	35.271	49.66	50.337	50.401	50.692
1	37	CY2000, SoakHrs=8, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	37	CY2000, SoakHrs=8, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	39.614	37.943	43.854	43.854	43.854	43.854
1	37	CY2000, SoakHrs=8, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	38	CY2000, SoakHrs=7, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	38	CY2000, SoakHrs=7, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	38.642	37	42.809	42.809	42.809	42.809
1	38	CY2000, SoakHrs=7, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	39	CY2000, SoakHrs=6, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	39	CY2000, SoakHrs=6, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	37.214	35.614	41.274	41.274	41.274	41.274
1	39	CY2000, SoakHrs=6, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	40	CY2000, SoakHrs=5, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	40	CY2000, SoakHrs=5, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	35.116	33.579	39.018	39.018	39.018	39.018
1	40	CY2000, SoakHrs=5, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	29.521	27.098	37.793	38.256	38.418	38.645
1	41	CY2000, SoakHrs=4, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	41	CY2000, SoakHrs=4, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	32.034	30.588	35.703	35.703	35.703	35.703
1	41	CY2000, SoakHrs=4, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	27.97	25.654	35.744	36.167	36.461	36.676
1	42	CY2000, SoakHrs=3, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	42	CY2000, SoakHrs=3, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	27.504	26.193	30.832	30.832	30.832	30.832
1	42	CY2000, SoakHrs=3, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	25.715	23.552	32.769	33.131	33.627	33.825
1	43	CY2000, SoakHrs=2, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	43	CY2000, SoakHrs=2, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	20.849	19.735	23.675	23.675	23.675	23.675
1	43	CY2000, SoakHrs=2, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.883	21.844	30.356	30.669	31.332	31.515
1	44	CY2000, SoakHrs=1, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	44	CY2000, SoakHrs=1, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	11.07	10.247	13.159	13.159	13.159	13.159
1	44	CY2000, SoakHrs=1, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.595	19.709	27.344	27.595	28.47	28.634
1	45	CY2000, SoakHrs=0.5, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	45	CY2000, SoakHrs=0.5, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	4.768	4.177	6.267	6.267	6.267	6.267
1	45	CY2000, SoakHrs=0.5, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	18.781	17.081	23.644	23.819	24.953	25.094
1	46	CY2000, SoakHrs=0.1667, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	46	CY2000, SoakHrs=0.1667, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	1.944	1.621	2.764	2.764	2.764	2.764
1	46	CY2000, SoakHrs=0.1667, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	14.177	12.781	17.6	17.646	19.204	19.307
1	47	CY2000, SoakHrs=0.10, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	47	CY2000, SoakHrs=0.10, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	1.71	1.422	2.442	2.442	2.442	2.442
1	47	CY2000, SoakHrs=0.10, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	12.971	11.653	16.018	16.031	17.707	17.8
1	48	CY2000, SoakHrs=0.017, Idle=1, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	48	CY2000, SoakHrs=0.017, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	1.611	1.357	2.256	2.256	2.256	2.256
1	48	CY2000, SoakHrs=0.017, Idle=1, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	10.842	9.662	13.227	13.18	15.062	15.138

Run	Scenario	Description	CY	Parameter	Units	ALL VEH	LDGV	LDGT1	LDGT2	LDGT3	LDGT4
1	49	CY2000, SoakHrs=12, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	49	CY2000, SoakHrs=12, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	73.369	69.942	82.065	82.065	82.065	82.065
1	49	CY2000, SoakHrs=12, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	40.118	36.667	52.28	52.945	53.923	54.21
1	50	CY2000, SoakHrs=11, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	50	CY2000, SoakHrs=11, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	72.952	69.537	81.617	81.617	81.617	81.617
1	50	CY2000, SoakHrs=11, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	38.404	35.271	49.66	50.337	50.401	50.692
1	51	CY2000, SoakHrs=10, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	51	CY2000, SoakHrs=10, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	72.339	68.943	80.958	80.958	80.958	80.958
1	51	CY2000, SoakHrs=10, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	38.404	35.271	49.66	50.337	50.401	50.692
1	52	CY2000, SoakHrs=9, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	52	CY2000, SoakHrs=9, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	71.439	68.069	79.99	79.99	79.99	79.99
1	52	CY2000, SoakHrs=9, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	53	CY2000, SoakHrs=8, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	53	CY2000, SoakHrs=8, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	70.117	66.786	78.568	78.568	78.568	78.568
1	53	CY2000, SoakHrs=8, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	54	CY2000, SoakHrs=7, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	54	CY2000, SoakHrs=7, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	68.173	64.9	76.478	76.478	76.478	76.478
1	54	CY2000, SoakHrs=7, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	55	CY2000, SoakHrs=6, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	55	CY2000, SoakHrs=6, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	65.318	62.13	73.407	73.407	73.407	73.407
1	55	CY2000, SoakHrs=6, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	29.521	27.098	37.793	38.256	38.418	38.645
1	56	CY2000, SoakHrs=5, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	56	CY2000, SoakHrs=5, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	61.122	58.058	68.894	68.894	68.894	68.894
1	56	CY2000, SoakHrs=5, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	27.97	25.654	35.744	36.167	36.461	36.676
1	57	CY2000, SoakHrs=4, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	57	CY2000, SoakHrs=4, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	54.956	52.076	62.264	62.264	62.264	62.264
1	57	CY2000, SoakHrs=4, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	26.299	24.097	33.539	33.917	34.36	34.562
1	58	CY2000, SoakHrs=3, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	58	CY2000, SoakHrs=3, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	45.898	43.287	52.523	52.523	52.523	52.523
1	58	CY2000, SoakHrs=3, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	24.507	22.426	31.177	31.507	32.114	32.301
1	59	CY2000, SoakHrs=2, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	59	CY2000, SoakHrs=2, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	32.587	30.372	38.208	38.208	38.208	38.208
1	59	CY2000, SoakHrs=2, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	22.595	20.642	28.661	28.939	29.721	29.893
1	60	CY2000, SoakHrs=1, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	60	CY2000, SoakHrs=1, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	14.33	12.92	17.909	17.909	17.909	17.909
1	60	CY2000, SoakHrs=1, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.911	19.07	26.445	26.677	27.615	27.774
1	61	CY2000, SoakHrs=0.5, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	61	CY2000, SoakHrs=0.5, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	6.393	5.548	8.538	8.538	8.538	8.538
1	61	CY2000, SoakHrs=0.5, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	18.781	17.081	23.644	23.819	24.953	25.094
1	62	CY2000, SoakHrs=0.1667, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	62	CY2000, SoakHrs=0.1667, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	3.527	2.94	5.015	5.015	5.015	5.015
1	62	CY2000, SoakHrs=0.1667, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	14.177	12.781	17.6	17.646	19.204	19.307
1	63	CY2000, SoakHrs=0.10, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	63	CY2000, SoakHrs=0.10, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	3.293	2.742	4.692	4.692	4.692	4.692
1	63	CY2000, SoakHrs=0.10, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	12.971	11.653	16.018	16.031	17.707	17.8
1	64	CY2000, SoakHrs=0.017, Idle=2, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	64	CY2000, SoakHrs=0.017, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	3.194	2.677	4.507	4.507	4.507	4.507
1	64	CY2000, SoakHrs=0.017, Idle=2, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	10.842	9.662	13.227	13.18	15.062	15.138
1	65	CY2000, SoakHrs=12, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	65	CY2000, SoakHrs=12, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	96.387	91.264	109.386	109.386	109.386	109.386
1	65	CY2000, SoakHrs=12, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	38.404	35.271	49.66	50.337	50.401	50.692
1	66	CY2000, SoakHrs=11, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	66	CY2000, SoakHrs=11, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	95.762	90.657	108.714	108.714	108.714	108.714
1	66	CY2000, SoakHrs=11, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	67	CY2000, SoakHrs=10, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	67	CY2000, SoakHrs=10, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	94.843	89.766	107.725	107.725	107.725	107.725
1	67	CY2000, SoakHrs=10, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	68	CY2000, SoakHrs=9, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	68	CY2000, SoakHrs=9, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	93.492	88.455	106.273	106.273	106.273	106.273
1	68	CY2000, SoakHrs=9, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	36.016	33.117	46.416	47.042	46.811	47.087
1	69	CY2000, SoakHrs=8, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	69	CY2000, SoakHrs=8, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	91.508	86.53	104.14	104.14	104.14	104.14
1	69	CY2000, SoakHrs=8, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	30.488	27.998	39.071	39.56	39.643	39.877
1	70	CY2000, SoakHrs=7, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	70	CY2000, SoakHrs=7, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	88.593	83.702	101.005	101.005	101.005	101.005
1	70	CY2000, SoakHrs=7, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	29.018	26.63	37.127	37.577	37.782	38.005
1	71	CY2000, SoakHrs=6, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	71	CY2000, SoakHrs=6, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	84.31	79.546	96.398	96.398	96.398	96.398
1	71	CY2000, SoakHrs=6, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	27.426	25.148	35.026	35.434	35.777	35.988
1	72	CY2000, SoakHrs=5, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	72	CY2000, SoakHrs=5, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	78.016	73.439	89.63	89.63	89.63	89.63
1	72	CY2000, SoakHrs=5, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	26.299	24.097	33.539	33.917	34.36	34.562

Run	Scenario	Description	CY	Parameter	Units	ALL VEH	LDGV	LDGT1	LDGT2	LDGT3	LDGT4
1	73	CY2000, SoakHrs=4, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	73	CY2000, SoakHrs=4, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	68.768	64.466	79.685	79.685	79.685	79.685
1	73	CY2000, SoakHrs=4, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	24.507	22.426	31.177	31.507	32.114	32.301
1	74	CY2000, SoakHrs=3, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	74	CY2000, SoakHrs=3, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	55.253	51.383	65.072	65.072	65.072	65.072
1	74	CY2000, SoakHrs=3, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.246	21.249	29.517	29.813	30.535	30.712
1	75	CY2000, SoakHrs=2, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	75	CY2000, SoakHrs=2, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	36.744	33.768	44.297	44.297	44.297	44.297
1	75	CY2000, SoakHrs=2, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.595	19.709	27.344	27.595	28.47	28.634
1	76	CY2000, SoakHrs=1, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	76	CY2000, SoakHrs=1, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	15.922	14.252	20.162	20.162	20.162	20.162
1	76	CY2000, SoakHrs=1, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.214	18.42	25.528	25.742	26.744	26.897
1	77	CY2000, SoakHrs=0.5, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	77	CY2000, SoakHrs=0.5, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	7.976	6.868	10.788	10.788	10.788	10.788
1	77	CY2000, SoakHrs=0.5, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	18.781	17.081	23.644	23.819	24.953	25.094
1	78	CY2000, SoakHrs=0.1667, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	78	CY2000, SoakHrs=0.1667, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	5.109	4.26	7.265	7.265	7.265	7.265
1	78	CY2000, SoakHrs=0.1667, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	14.177	12.781	17.6	17.646	19.204	19.307
1	79	CY2000, SoakHrs=0.10, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	79	CY2000, SoakHrs=0.10, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	4.876	4.061	6.943	6.943	6.943	6.943
1	79	CY2000, SoakHrs=0.10, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	12.971	11.653	16.018	16.031	17.707	17.8
1	80	CY2000, SoakHrs=0.017, Idle=3, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	80	CY2000, SoakHrs=0.017, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	4.777	3.996	6.757	6.757	6.757	6.757
1	80	CY2000, SoakHrs=0.017, Idle=3, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	10.842	9.662	13.227	13.18	15.062	15.138
1	81	CY2000, SoakHrs=12, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	81	CY2000, SoakHrs=12, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	117.042	109.168	137.02	137.02	137.02	137.02
1	81	CY2000, SoakHrs=12, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	28.501	26.148	36.444	36.881	37.13	37.349
1	82	CY2000, SoakHrs=11, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	82	CY2000, SoakHrs=11, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	116.089	108.263	135.947	135.947	135.947	135.947
1	82	CY2000, SoakHrs=11, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	27.97	25.654	35.744	36.167	36.461	36.676
1	83	CY2000, SoakHrs=10, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	83	CY2000, SoakHrs=10, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	114.693	106.936	134.376	134.376	134.376	134.376
1	83	CY2000, SoakHrs=10, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	26.869	24.628	34.291	34.684	35.077	35.283
1	84	CY2000, SoakHrs=9, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	84	CY2000, SoakHrs=9, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	112.652	104.996	132.078	132.078	132.078	132.078
1	84	CY2000, SoakHrs=9, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	26.299	24.097	33.539	33.917	34.36	34.562
1	85	CY2000, SoakHrs=8, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	85	CY2000, SoakHrs=8, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	109.671	102.163	128.723	128.723	128.723	128.723
1	85	CY2000, SoakHrs=8, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	25.117	22.995	31.982	32.328	32.879	33.071
1	86	CY2000, SoakHrs=7, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	86	CY2000, SoakHrs=7, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	105.333	98.039	123.842	123.842	123.842	123.842
1	86	CY2000, SoakHrs=7, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	24.507	22.426	31.177	31.507	32.114	32.301
1	87	CY2000, SoakHrs=6, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	87	CY2000, SoakHrs=6, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	99.05	92.065	116.774	116.774	116.774	116.774
1	87	CY2000, SoakHrs=6, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.883	21.844	30.356	30.669	31.332	31.515
1	88	CY2000, SoakHrs=5, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	88	CY2000, SoakHrs=5, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	90.049	83.52	106.615	106.615	106.615	106.615
1	88	CY2000, SoakHrs=5, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	22.595	20.642	28.661	28.939	29.721	29.893
1	89	CY2000, SoakHrs=4, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	89	CY2000, SoakHrs=4, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	77.472	71.674	92.185	92.185	92.185	92.185
1	89	CY2000, SoakHrs=4, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.595	19.709	27.344	27.595	28.47	28.634
1	90	CY2000, SoakHrs=3, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	90	CY2000, SoakHrs=3, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	60.647	55.866	72.781	72.781	72.781	72.781
1	90	CY2000, SoakHrs=3, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.911	19.07	26.445	26.677	27.615	27.774
1	91	CY2000, SoakHrs=2, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	91	CY2000, SoakHrs=2, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	40.112	36.577	49.081	49.081	49.081	49.081
1	91	CY2000, SoakHrs=2, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.214	18.42	25.528	25.742	26.744	26.897
1	92	CY2000, SoakHrs=1, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	92	CY2000, SoakHrs=1, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	19.088	16.891	24.663	24.663	24.663	24.663
1	92	CY2000, SoakHrs=1, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.144	17.421	24.122	24.306	25.407	25.551
1	93	CY2000, SoakHrs=0.5, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	93	CY2000, SoakHrs=0.5, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	11.141	9.507	15.29	15.29	15.29	15.29
1	93	CY2000, SoakHrs=0.5, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	18.781	17.081	23.644	23.819	24.953	25.094
1	94	CY2000, SoakHrs=0.1667, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	94	CY2000, SoakHrs=0.1667, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	8.275	6.899	11.766	11.766	11.766	11.766
1	94	CY2000, SoakHrs=0.1667, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	14.568	13.146	18.111	18.169	19.688	19.794
1	95	CY2000, SoakHrs=0.10, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	95	CY2000, SoakHrs=0.10, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	8.041	6.7	11.444	11.444	11.444	11.444
1	95	CY2000, SoakHrs=0.10, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	12.971	11.653	16.018	16.031	17.707	17.8
1	96	CY2000, SoakHrs=0.017, Idle=5, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	96	CY2000, SoakHrs=0.017, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	7.942	6.635	11.258	11.258	11.258	11.258
1	96	CY2000, SoakHrs=0.017, Idle=5, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	11.28	10.071	13.801	13.767	15.607	15.686

Run	Scenario	Description	CY	Parameter	Units	ALL VEH	LDGV	LDGT1	LDGT2	LDGT3	LDGT4
1	97	CY2000, SoakHrs=12, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	97	CY2000, SoakHrs=12, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	126.89	117.356	151.084	151.084	151.084	151.084
1	97	CY2000, SoakHrs=12, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	24.507	22.426	31.177	31.507	32.114	32.301
1	98	CY2000, SoakHrs=11, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	98	CY2000, SoakHrs=11, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	125.844	116.371	149.883	149.883	149.883	149.883
1	98	CY2000, SoakHrs=11, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.883	21.844	30.356	30.669	31.332	31.515
1	99	CY2000, SoakHrs=10, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	99	CY2000, SoakHrs=10, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	124.317	114.932	148.13	148.13	148.13	148.13
1	99	CY2000, SoakHrs=10, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.883	21.844	30.356	30.669	31.332	31.515
1	100	CY2000, SoakHrs=9, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	100	CY2000, SoakHrs=9, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	122.091	112.836	145.576	145.576	145.576	145.576
1	100	CY2000, SoakHrs=9, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.246	21.249	29.517	29.813	30.535	30.712
1	101	CY2000, SoakHrs=8, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	101	CY2000, SoakHrs=8, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	118.863	109.796	141.87	141.87	141.87	141.87
1	101	CY2000, SoakHrs=8, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	22.595	20.642	28.661	28.939	29.721	29.893
1	102	CY2000, SoakHrs=7, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	102	CY2000, SoakHrs=7, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	114.211	105.415	136.528	136.528	136.528	136.528
1	102	CY2000, SoakHrs=7, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.932	20.023	27.787	28.048	28.891	29.058
1	103	CY2000, SoakHrs=6, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	103	CY2000, SoakHrs=6, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	107.569	99.162	128.901	128.901	128.901	128.901
1	103	CY2000, SoakHrs=6, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.595	19.709	27.344	27.595	28.47	28.634
1	104	CY2000, SoakHrs=5, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	104	CY2000, SoakHrs=5, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	98.232	90.373	118.173	118.173	118.173	118.173
1	104	CY2000, SoakHrs=5, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.911	19.07	26.445	26.677	27.615	27.774
1	105	CY2000, SoakHrs=4, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	105	CY2000, SoakHrs=4, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	85.421	78.319	103.443	103.443	103.443	103.443
1	105	CY2000, SoakHrs=4, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.564	18.747	25.989	26.212	27.182	27.337
1	106	CY2000, SoakHrs=3, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	106	CY2000, SoakHrs=3, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	68.561	62.463	84.033	84.033	84.033	84.033
1	106	CY2000, SoakHrs=3, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.214	18.42	25.528	25.742	26.744	26.897
1	107	CY2000, SoakHrs=2, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	107	CY2000, SoakHrs=2, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	48.025	43.175	60.334	60.334	60.334	60.334
1	107	CY2000, SoakHrs=2, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.504	17.757	24.595	24.789	25.857	26.004
1	108	CY2000, SoakHrs=1, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	108	CY2000, SoakHrs=1, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	27.001	23.488	35.916	35.916	35.916	35.916
1	108	CY2000, SoakHrs=1, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.144	17.421	24.122	24.306	25.407	25.551
1	109	CY2000, SoakHrs=0.5, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	109	CY2000, SoakHrs=0.5, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	19.055	16.104	26.542	26.542	26.542	26.542
1	109	CY2000, SoakHrs=0.5, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	18.781	17.081	23.644	23.819	24.953	25.094
1	110	CY2000, SoakHrs=0.1667, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	110	CY2000, SoakHrs=0.1667, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	16.188	13.496	23.019	23.019	23.019	23.019
1	110	CY2000, SoakHrs=0.1667, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	14.967	13.519	18.636	18.705	20.187	20.297
1	111	CY2000, SoakHrs=0.10, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	111	CY2000, SoakHrs=0.10, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	15.955	13.298	22.697	22.697	22.697	22.697
1	111	CY2000, SoakHrs=0.10, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	13.379	12.034	16.553	16.577	18.213	18.31
1	112	CY2000, SoakHrs=0.017, Idle=10, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	112	CY2000, SoakHrs=0.017, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	15.856	13.233	22.511	22.511	22.511	22.511
1	112	CY2000, SoakHrs=0.017, Idle=10, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	11.28	10.071	13.801	13.767	15.607	15.686
1	113	CY2000, SoakHrs=12, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	113	CY2000, SoakHrs=12, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	134.804	123.953	162.336	162.336	162.336	162.336
1	113	CY2000, SoakHrs=12, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.246	21.249	29.517	29.813	30.535	30.712
1	114	CY2000, SoakHrs=11, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	114	CY2000, SoakHrs=11, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	133.758	122.968	161.136	161.136	161.136	161.136
1	114	CY2000, SoakHrs=11, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.246	21.249	29.517	29.813	30.535	30.712
1	115	CY2000, SoakHrs=10, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	115	CY2000, SoakHrs=10, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	132.23	121.529	159.383	159.383	159.383	159.383
1	115	CY2000, SoakHrs=10, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	22.595	20.642	28.661	28.939	29.721	29.893
1	116	CY2000, SoakHrs=9, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	116	CY2000, SoakHrs=9, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	130.005	119.434	156.828	156.828	156.828	156.828
1	116	CY2000, SoakHrs=9, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.932	20.023	27.787	28.048	28.891	29.058
1	117	CY2000, SoakHrs=8, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	117	CY2000, SoakHrs=8, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	126.777	116.394	153.123	153.123	153.123	153.123
1	117	CY2000, SoakHrs=8, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.595	19.709	27.344	27.595	28.47	28.634
1	118	CY2000, SoakHrs=7, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	118	CY2000, SoakHrs=7, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	122.124	112.013	147.781	147.781	147.781	147.781
1	118	CY2000, SoakHrs=7, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.255	19.391	26.897	27.138	28.045	28.206
1	119	CY2000, SoakHrs=6, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	119	CY2000, SoakHrs=6, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	115.483	105.76	140.154	140.154	140.154	140.154
1	119	CY2000, SoakHrs=6, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.911	19.07	26.445	26.677	27.615	27.774
1	120	CY2000, SoakHrs=5, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	120	CY2000, SoakHrs=5, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	106.145	96.97	129.426	129.426	129.426	129.426
1	120	CY2000, SoakHrs=5, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.214	18.42	25.528	25.742	26.744	26.897

Run	Scenario	Description	CY	Parameter	Units	ALL VEH	LDGV	LDGT1	LDGT2	LDGT3	LDGT4
1	121	CY2000, SoakHrs=4, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	121	CY2000, SoakHrs=4, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	93.335	84.916	114.696	114.696	114.696	114.696
1	121	CY2000, SoakHrs=4, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.861	18.09	25.064	25.268	26.303	26.453
1	122	CY2000, SoakHrs=3, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	122	CY2000, SoakHrs=3, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	76.474	69.061	95.286	95.286	95.286	95.286
1	122	CY2000, SoakHrs=3, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.504	17.757	24.595	24.789	25.857	26.004
1	123	CY2000, SoakHrs=2, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	123	CY2000, SoakHrs=2, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	55.939	49.772	71.586	71.586	71.586	71.586
1	123	CY2000, SoakHrs=2, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.144	17.421	24.122	24.306	25.407	25.551
1	124	CY2000, SoakHrs=1, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	124	CY2000, SoakHrs=1, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	34.915	30.085	47.169	47.169	47.169	47.169
1	124	CY2000, SoakHrs=1, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	18.781	17.081	23.644	23.819	24.953	25.094
1	125	CY2000, SoakHrs=0.5, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	125	CY2000, SoakHrs=0.5, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	26.968	22.701	37.795	37.795	37.795	37.795
1	125	CY2000, SoakHrs=0.5, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	18.414	16.739	23.163	23.327	24.495	24.633
1	126	CY2000, SoakHrs=0.1667, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	126	CY2000, SoakHrs=0.1667, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	24.102	20.093	34.272	34.272	34.272	34.272
1	126	CY2000, SoakHrs=0.1667, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	15.363	13.889	19.156	19.236	20.682	20.795
1	127	CY2000, SoakHrs=0.10, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	127	CY2000, SoakHrs=0.10, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	23.868	19.895	33.95	33.95	33.95	33.95
1	127	CY2000, SoakHrs=0.10, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	13.781	12.41	17.08	17.116	18.712	18.812
1	128	CY2000, SoakHrs=0.017, Idle=15, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	128	CY2000, SoakHrs=0.017, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	23.769	19.83	33.764	33.764	33.764	33.764
1	128	CY2000, SoakHrs=0.017, Idle=15, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	11.28	10.071	13.801	13.767	15.607	15.686
1	129	CY2000, SoakHrs=12, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	129	CY2000, SoakHrs=12, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	41.24	39.521	45.603	45.603	45.603	45.603
1	129	CY2000, SoakHrs=12, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	44.379	40.103	58.867	59.492	62.824	63.098
1	130	CY2000, SoakHrs=11, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	130	CY2000, SoakHrs=11, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	141.671	129.566	172.389	172.389	172.389	172.389
1	130	CY2000, SoakHrs=11, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	23.246	21.249	29.517	29.813	30.535	30.712
1	131	CY2000, SoakHrs=10, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	131	CY2000, SoakHrs=10, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	140.144	128.127	170.636	170.636	170.636	170.636
1	131	CY2000, SoakHrs=10, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	22.595	20.642	28.661	28.939	29.721	29.893
1	132	CY2000, SoakHrs=9, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	132	CY2000, SoakHrs=9, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	137.918	126.031	168.081	168.081	168.081	168.081
1	132	CY2000, SoakHrs=9, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.932	20.023	27.787	28.048	28.891	29.058
1	133	CY2000, SoakHrs=8, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	133	CY2000, SoakHrs=8, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	134.69	122.991	164.376	164.376	164.376	164.376
1	133	CY2000, SoakHrs=8, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.595	19.709	27.344	27.595	28.47	28.634
1	134	CY2000, SoakHrs=7, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	134	CY2000, SoakHrs=7, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	130.037	118.61	159.034	159.034	159.034	159.034
1	134	CY2000, SoakHrs=7, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	21.255	19.391	26.897	27.138	28.045	28.206
1	135	CY2000, SoakHrs=6, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	135	CY2000, SoakHrs=6, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	123.396	112.357	151.407	151.407	151.407	151.407
1	135	CY2000, SoakHrs=6, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.911	19.07	26.445	26.677	27.615	27.774
1	136	CY2000, SoakHrs=5, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	136	CY2000, SoakHrs=5, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	114.059	103.568	140.678	140.678	140.678	140.678
1	136	CY2000, SoakHrs=5, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	20.214	18.42	25.528	25.742	26.744	26.897
1	137	CY2000, SoakHrs=4, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	137	CY2000, SoakHrs=4, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	101.248	91.513	125.949	125.949	125.949	125.949
1	137	CY2000, SoakHrs=4, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.861	18.09	25.064	25.268	26.303	26.453
1	138	CY2000, SoakHrs=3, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	138	CY2000, SoakHrs=3, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	84.388	75.658	106.539	106.539	106.539	106.539
1	138	CY2000, SoakHrs=3, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.504	17.757	24.595	24.789	25.857	26.004
1	139	CY2000, SoakHrs=2, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	139	CY2000, SoakHrs=2, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	63.852	56.369	82.839	82.839	82.839	82.839
1	139	CY2000, SoakHrs=2, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	19.144	17.421	24.122	24.306	25.407	25.551
1	140	CY2000, SoakHrs=1, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	140	CY2000, SoakHrs=1, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	42.828	36.683	58.422	58.422	58.422	58.422
1	140	CY2000, SoakHrs=1, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	18.781	17.081	23.644	23.819	24.953	25.094
1	141	CY2000, SoakHrs=0.5, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	141	CY2000, SoakHrs=0.5, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	34.882	29.299	49.048	49.048	49.048	49.048
1	141	CY2000, SoakHrs=0.5, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	18.414	16.739	23.163	23.327	24.495	24.633
1	142	CY2000, SoakHrs=0.1667, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	142	CY2000, SoakHrs=0.1667, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	32.015	26.691	45.525	45.525	45.525	45.525
1	142	CY2000, SoakHrs=0.1667, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	15.363	13.889	19.156	19.236	20.682	20.795
1	143	CY2000, SoakHrs=0.10, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	143	CY2000, SoakHrs=0.10, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	31.781	26.492	45.203	45.203	45.203	45.203
1	143	CY2000, SoakHrs=0.10, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	13.781	12.41	17.08	17.116	18.712	18.812
1	144	CY2000, SoakHrs=0.017, Idle=20, Plug=0, 20 mph, Arterial	2000	VMT	fraction	1	0.6879	0.051	0.1697	0.0345	0.0159
1	144	CY2000, SoakHrs=0.017, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Idle	(g/trip)	31.682	26.427	45.017	45.017	45.017	45.017
1	144	CY2000, SoakHrs=0.017, Idle=20, Plug=0, 20 mph, Arterial	2000	CO-Trav	(g/mile)	11.28	10.071	13.801	13.767	15.607	15.686

Affidavit of Oral Hearing

STATE OF ALASKA)
) ss.
FOURTH JUDICIAL DISTRICT)

AFFIDAVIT OF ORAL HEARING

I, Joan Hardesty, Environmental Program Specialist III of the Department of Environmental Conservation, being sworn, state the following:

On January 3, 2008, at 12:00 PM to 1:30 PM, in First Floor Conference Room B/C, 610 University Avenue, Fairbanks, Alaska, I presided over a public hearing held in accordance with AS 44.62.210 for the purpose of taking testimony in connection with the adoption of changes to Title 18, Chapter 50, Air Quality Control, and Title 18, Chapter 52, Emissions Inspection and Maintenance Requirements for Motor Vehicles pertaining to: adding flexibility to 18 AAC 52 to allow for suspension and reestablishment of local vehicle inspection programs; updating 18 AAC 52.060(d)(1)(A) to reflect the latest federal poverty guidelines; updating 18 AAC 52.005 to further clarify the term "Municipality of Anchorage" as the I/M area for the commuter I/M program; updating 18 AAC 50.030 to adopt by reference the revisions to the State Air Quality Control Plan for the Fairbanks Carbon Monoxide (CO) control plan and state transportation control program; updating Section II of the State Air Quality Control Plan by incorporating the revisions to 18 AAC 52; updating Section III.A of the State Air Quality Control Plan by incorporating the revisions to 18 AAC 52 into the state transportation control program; updating Section III.C of the State Air Quality Control Plan by incorporating revisions to the Fairbanks Carbon Monoxide control plan that would allow for the suspension of the local vehicle inspection program while demonstrating continued maintenance of the health standard including a revised emissions inventory, emission control strategies, contingency control measures, and mobile source emissions budget; and updating the State Air Quality Control Plan appendices for Section III.A and III.C.

DATE: January 4, 2008
Fairbanks, Alaska

Joan E Hardesty
Joan Hardesty, Environmental Program Specialist III

SUBSCRIBED AND SWORN TO before me this 4 day of January, 2008

[signature]
Notary Public in and for the
State of Alaska
My commission expires: 1/11/08.

STATE OF ALASKA)
) ss.
THIRD JUDICIAL DISTRICT)

AFFIDAVIT OF ORAL HEARING

I, Tom Turner, Environmental Program Manger of the Department of Environmental Conservation, being sworn, state the following:

On January 3, 2008, at 1200 to 1330, in the Alaska Department of Environmental Conservation Building, First Floor Large Conference Room, 555 Cordova St., Anchorage, Alaska 99501, I presided over a public hearing held in accordance with AS 44.62.210 for the purpose of taking testimony in connection with the adoption of changes to 18 AAC 50, Air Quality Control and 18 AAC 52, Emissions Inspection and Maintenance Requirements for Motor Vehicles pertaining to: adding flexibility to 18 AAC 52 to allow for suspension and reestablishment of local vehicle inspection programs; updating 18 AAC 52.060(d)(1)(A) to reflect the latest federal poverty guidelines; updating 18 AAC 52.005 to further clarify the term "Municipality of Anchorage" as the I/M area for the commuter I/M program; updating 18 AAC 50.030 to adopt by reference the revisions to the State Air Quality Control Plan for the Fairbanks Carbon Monoxide (CO) control plan and state transportation control program; updating Section II of the State Air Quality Control Plan by incorporating the revisions to 18 AAC 52; updating Section III.A of the State Air Quality Control Plan by incorporating the revisions to 18 AAC 52 into the state transportation control program; updating Section III.C of the State Air Quality Control Plan by incorporating revisions to the Fairbanks Carbon Monoxide control plan that would allow for the suspension of the local vehicle inspection program while demonstrating continued maintenance of the health standard including a revised emissions inventory, emission control strategies, contingency control measures, and mobile source emissions budget; and updating the State Air Quality Control Plan appendices for Section III.A and III.C.to update federal rules cited in state regulations which have been superseded; to adopt clarifications to existing regulations to fix typos, incorrect references, and internal regulation conflicts; and to make additional changes necessary to clarify the regulations.

DATE: 01/03/2008
Anchorage, Alaska

Tom Turner, Environmental Program Manager

SUBSCRIBED AND SWORN TO before me this 3rd day of January, 2008.

[NOTARY SEAL]
ROSEMARY G. RITTER
NOTARY
PUBLIC
STATE OF ALASKA

Rosemary G. Ritter
Notary Public in and for the
State of Alaska
My commission expires: 10·01·08.

Alaska Department of Environmental Conservation
Response to Oral and Written Comments on the
Fairbanks Carbon Monoxide Maintenance Plan

Response to Public Comments

on the Proposed Amendments to

Title 18, Alaska Administrative Code, Chapter 50, Air Quality Control

&

Title 18, Alaska Administrative Code, Chapter 52 Emissions Inspection and Maintenance Requirements for Motor Vehicles

Close of Comments: 5 PM, January 7, 2008

Alaska Department of Environmental Conservation
Division of Air Quality
Air Non-Point & Mobile Source Program

Response Dated January 18, 2008

1.0 Introduction

This document contains the Department of Environmental Conservation's (ADEC) response to public comments on the proposed amendments to Title 18 Alaska Administrative Code (AAC) Chapter 50-Air Quality Control, and Title 18 AAC Chapter 52- Emissions Inspection Maintenance Requirements for Motor Vehicles. The public comment period opened on November 21, 2007 and ended on January 7, 2008.

Background Information
In 2004, Anchorage and Fairbanks were reclassified by the U.S. Environmental Protection Agency (EPA) as carbon monoxide (CO) maintenance areas. As a result, federal requirements allow both areas to consider moving their local vehicle inspection & maintenance (I/M) programs from active control measures to contingency measures within their control plans.

The proposed changes to 18 AAC 52 provide, in part, the opportunity to suspend the local I/M programs after consultation and approval by EPA of a revision to the control plan and to provide for reestablishment of I/M if needed as a control plan contingency measure. The proposed changes to 18 AAC 50.030 and the State Air Quality Control Plan (SIP) would reflect these revisions to 18 AAC 52 as well as provide for an updated Fairbanks CO maintenance plan that proposed to suspend the local I/M program in 2010. Specifically, the proposed amendments will:

- add flexibility to 18 AAC 52 to allow for suspension and reestablishment of local vehicle inspection and maintenance programs;
- update 18 AAC 52.060(d)(1)(A) to adopt by reference the latest federal poverty guidelines;
- update 18 AAC 52.005 to further clarify the term "Municipality of Anchorage" as the I/M area for the commuter I/M program;
- update 18 AAC 50.030 to adopt by reference the latest revisions to the State Air Quality Control Plan for the Fairbanks Carbon Monoxide (CO) control plan and state transportation control program;
- update Section II of the State Air Quality Control Plan by incorporating the revisions to 18 AAC 52;
- update Section III.A of the State Air Quality Control Plan by incorporating the revisions to 18 AAC 52 into the state transportation control program;
- update Section III.C of the State Air Quality Control Plan by incorporating revisions to the Fairbanks Carbon Monoxide control plan that would allow for the suspension of the local vehicle inspection program while demonstrating continued maintenance of the health standard including a revised emissions inventory, emission control strategies, contingency control measures, and mobile source emissions budget; and
- update the State Air Quality Control Plan appendices for Section III.A and III.C.

Two public hearings were held simultaneously at the ADEC offices located at 610 University Avenue, in Fairbanks, Alaska and at 555 Cordova Street, in Anchorage, Alaska from 12:00 pm to 1:30 pm on January 3, 2008. Oral comment was received from one person attending the public hearing in Fairbanks and from one person attending the public hearing in Anchorage. ADEC received two written comments concerning the impact of this regulation change on the Anchorage I/M program. One additional written comment was received a few minutes past the comment deadline, but was substantially the same as one of the other timely written comments. A summary of the oral and written public comments and ADEC's response to these comments are presented in the following sections. Oral comments have been paraphrased in this summary; verbatim transcripts are available for both public hearings.

2.0 Summary of and Response to Oral Comments

Oral Comment 1: Scott Allen from Ester, Alaska provided testimony at the Fairbanks public hearing. His testimony indicated that he wanted the I/M program discontinued because he did not believe it had ever worked and that automotive technology has made the testing superfluous. He also noted that it increases the licensing costs to vehicle owners and that funding could be better directed elsewhere. He concluded with his view that the program is another layer of bureaucracy and unnecessary.

ADEC Response to Oral Comment 1: The department believes that the vehicle I/M program has been an effective primary control measure for improving air quality in Anchorage and Fairbanks and for helping both of these communities reach attainment of the CO standard. While EPA requirements on the automobile industry have decreased pollutant emissions from new vehicles over time, those requirements combined with the application of vigorous local I/M programs were major contributors to Anchorage and Fairbanks meeting the CO standard.

In 2004, Anchorage and Fairbanks attained the EPA's CO health standards and were redesignated by the U.S. Environmental Protection Agency (EPA) as CO maintenance areas. As a result of this shift to maintenance status, federal requirements allow vehicle inspection & maintenance (I/M) programs to move from active controls to contingency measures within local air quality control plans. In order to discontinue the I/M programs, updated control plans must demonstrate the programs are no longer needed to keep CO levels below the health standard. The plans must also keep the programs as contingency measures should problems occur in the future. While the federal requirements allow for areas to remove local I/M programs, there is no federal requirement for local communities to do so.

The proposed regulation changes to 18 AAC 52 would allow Fairbanks and Anchorage to discontinue their I/M programs following consultation with the EPA and EPA's approval of an updated air quality control plan. However, federal requirements dictate the I/M program remain as a contingency measure in the local air quality control plan. Therefore, the proposed regulation changes provide an opportunity to reestablish the I/M program if needed.

Under the proposed regulation changes to 18 AAC 50, the state is also proposing to adopt changes to the Fairbanks CO Maintenance Plan. The Fairbanks plan demonstrates maintenance with the health standards with a suspension of the I/M program in 2010. The plan proposes to suspend the I/M program at that time and moves the program into contingency measure status. However, the program cannot be suspended until the EPA formally approves the Fairbanks CO Maintenance Plan revisions.

Record of Consideration and Use of Oral Comment 1: This comment supports the proposed revisions to the Fairbanks Air Quality Control Plan and no suggestions were made for revisions to the proposal. As a result, no changes were made to the proposed regulations and Air Quality Control Plan as a result of this comment.

Oral Comment 2: Andy Fritchen and Jim Lewis from the United Parcel Service were both present at the Anchorage public hearing. Mr. Fritchen did not provide specific testimony on the proposed regulations but had some questions about the Alaska I/M Program. He wanted to find out about "regulation changes that would drastically affect our emission control program in the Anchorage area which includes the airport operation vehicles that are based in Anchorage." Mr. Fritchen wanted information on major changes to the I/M program which UPS may have to comply with in the future.

ADEC Response to Oral Comment 2: These questions addressed whether or not there are plans to change the I/M programs in Alaska and do not specifically address the regulation changes under consideration. Alice Edwards, Environmental Program Manager of the Air Non-Point & Mobile Source Section, Division of Air Quality, ADEC was present at the Anchorage public hearing via telephone and responded to Mr. Fritchen.

ADEC responded by saying that the primary purpose of the proposed regulation change is to establish a mechanism to shutdown and startup a vehicle I/M program upon approval of an updated carbon monoxide implementation plan for the affected community. Other minor clean up revisions are also included. In Alaska, only Anchorage and Fairbanks have these plans. There is a plan for Fairbanks to discontinue its local I/M program starting in 2010, if approved by the EPA. There is no similar plan for Anchorage at this time, so nothing is included in this package. ADEC indicated that there are no other I/M regulation revisions currently being developed by the Department and clarified that this proposal did not include any changes to vehicle emission standards under the current I/M program. Mr. Fritchen was referred to contact Cindy Heil, the state I/M program administrator in the ADEC Anchorage office, to ensure that UPS had access to existing vehicle emission requirements and could be informed of any future I/M regulation packages.

Record of Consideration and Use of Oral Comment 2: The questions posed were more general in nature regarding future plans for changes to the I/M programs in Alaska and did not specifically address the proposed regulation changes currently under consideration. No suggestions were made for revisions to the proposal. As a result, no changes were made to the proposed regulations and Air Quality Control Plan as a result of these questions.

3.0 Summary of and Response to Written Public Comments

ADEC received two written comments within the public comment period, one from a private citizen and one from the American Lung Association of Alaska. Both written comments were in favor of keeping the Anchorage I/M program intact, and because these comments are similar in nature, are presented together. One written comment was also received from a private citizen via email after the close of the comment period, but is substantially the same as the two written comments received within the comment period. ADEC's response to these written public comments is presented below.

Written Comment 1: Written comments from Marge Larson, Executive Director, American Lung Association of Alaska, were received via email on January 7, 2008 at 4:25 PM:

"To whom it may concern: I am writing to express the American Lung Association of Alaska's support for the Anchorage I/M inspection program. Air quality, both indoor and out, plays an important role in lung health, and we believe that the current program has been successful removing harmful pollutants from Anchorage air, and therefore protects Anchorage residents, particularly those with lung disease. We oppose a change in the State Implementation Plan (SIP) that would allow Anchorage to eliminate this program.

I have attached a local study by Dr. Maryellen Gordian published in The Journal of Exposure Science and Environmental Epidemiology. The study shows an increased risk of asthma for children who attend school near high traffic intersections; that risk will be even higher if the I/M testing program is discontinued. Included herein are numbers of Anchorage residents who have already been diagnosed with a lung disease or other chronic disease affected by air pollution.

	Total Pop	Under 18	65 & Over	Pediatric Asthma	Adult Asthma	Chronic Bronchitis	Emphysema	Cardiovascular Disease	Diabetes
ANCHORAGE	275,043	77,655	17,615	6,911	15,331	7,894	2,768	52,891	13,061

Other than our concerns that the elimination of the I/M program would decrease the air quality in Anchorage resulting in serious health risks, we feel that the termination of the program also poses other questions that have gone unanswered by public officials:

- Currently, the I/M program funds air quality testing required by the EPA in order to receive federal transportation funds. If the program is eliminated, how will the Municipality continue to fund this mandatory program?

- While the program's main point of focus has been carbon monoxide, it has also impacted the emissions of other harmful pollutants. Are those pollutants, such as benzene, on a decline similar to that of CO? If not, how will the Municipality address an increase in these chemicals?

In light of these concerns, we do not support a change in the State Implementation Plan, and encourage the Department of Environmental Conservation to advise the Municipality of Anchorage to keep the I/M program in place."

Written Comment 2: Faxed comments were received from Van Bakel of Anchorage, Alaska at 1:28 PM on January 7, 2008 as follows: "The emission testing program in the state of Alaska has done a world of good in cleaning up air quality & educating residents about the maintenance of their vehicles. The program has forced air quality standards to come into compliance. This Program is working and succeeding in getting its job done! Why in the world would we want to stop a successful program that works!!! The cost of this program is minimal to the actual user of the resource and it is cost prohibitive to any user group. Please consider the I/M task force recommendations that were put forth from the Anchorage I/M task force. These adaptations seem to answer all public complaints, while maintaining a clean air program. It is the air that we breathe, do we not have to do all that we can to keep it clean?"

ADEC Response to Written Comments: The department believes that the vehicle I/M program has been an effective primary control measure for improving air quality in Anchorage and Fairbanks and for helping both of these communities reach attainment of the CO standard. While EPA requirements on the automobile industry have decreased pollutant emissions from new vehicles over time, those requirements combined with the application of vigorous local I/M programs were major contributors to Anchorage and Fairbanks meeting the CO standard.

In 2004, Anchorage and Fairbanks attained the EPA's CO health standards and were redesignated by the U.S. Environmental Protection Agency (EPA) as CO maintenance areas. As a result of this shift to maintenance status, federal requirements allow vehicle inspection & maintenance (I/M) programs to move from active controls to contingency measures within local air quality control plans. In order to discontinue the I/M programs, updated control plans must demonstrate the programs are no longer needed to keep CO levels below the health standard. The plans must also keep the programs as contingency measures should problems occur in the future. While the federal requirements allow for areas to remove local I/M programs, there is no federal requirement for local communities to do so.

ADEC's proposed regulation changes to 18 AAC 52 would allow Fairbanks and Anchorage to discontinue their I/M programs following consultation with the EPA and EPA's approval of an updated air quality maintenance plan. The proposed regulation changes also provide an opportunity for Fairbanks and Anchorage to reestablish their I/M program, if needed, as an Air Quality Control Plan contingency measure. The proposed regulation revision to 18 AAC 52 does not require a community to discontinue their local I/M program, but establishes the mechanism to do so.

The proposed revisions to 18 AAC 50 and the State Air Quality Control Plan do not take any steps to suspend the Anchorage I/M program. Any changes to, or suspension of, the Anchorage I/M program must be addressed through a revision of the Anchorage Carbon Monoxide Maintenance Plan and must be approved by the EPA. The Anchorage metropolitan planning organization, Anchorage Metropolitan Area Transportation Solutions (AMATS), is delegated the responsibility for developing local air quality plans for carbon monoxide in Anchorage. AMATS recommends any new air quality plan to the Anchorage Assembly for approval. AMATS is the regulatory entity responsible for initiating updates to the Anchorage air quality control plan. Consideration of the Anchorage I/M Task Force recommendations for the local I/M program are best addressed by AMATS and the Municipality of Anchorage. Their process allows for public comment and public hearings on changes to the local I/M program and the Anchorage CO maintenance plan.

If in the future AMATS and the Municipality of Anchorage propose changes to, or suspension of, the Anchorage I/M program, they must update the Anchorage CO maintenance plan and demonstrate how future compliance with the carbon monoxide air quality standard will be achieved. A proposed suspension of the I/M program requires the Anchorage CO maintenance plan maintain the I/M program as a contingency measure should future violations of the CO health standard occur. In addition, the plan must demonstrate adequate resources to fund remaining plan activities, including monitoring to track compliance with CO ambient air quality health standards.

As noted in the comments, while the I/M program was established to help Anchorage meet CO standards it may impact other pollutant emissions as well. For this reason, an updated air quality plan would also address requirements of Clean Air Act section 110(l) ensuring that suspension of the I/M program would not cause attainment problems for the other criteria pollutants. Unfortunately, hazardous air pollutants, such as benzene, do not have national ambient air quality standards established by EPA.

Record of Consideration and Use of Written Comments: These comments support retaining the Anchorage I/M program. This regulation proposal does not have any substantial effect on the implementation of the Anchorage program, although it does allow for changes in the future. For the Fairbanks Air Quality Control Plan, no factual information is provided to suggest the proposed plan is flawed in meeting state and federal requirements and should be revised. As a result, no changes were made to the proposed regulations and Air Quality Control Plan as a result of these comments.

Written Comment Received After the Comment Period: Mary Ann Pease with MAP Consulting, LLC emailed the following comments received at 5:04 PM on Jan. 7, 2008: "Any alteration of the IM program should be carefully weighed against the unquestionable benefits the program has had on air quality in Anchorage. In years past, a yellow band of smog would form over the city or the Inlet, particularly in the wintertime. That identifiable air pollution no longer exists, thanks in large part to the IM testing program, which has removed non-compliant vehicles from Anchorage's roadways. Clearly the program has been a success, and its continuation will ensure that Anchorage air quality continues to meet federal standards. Anchorage air quality has also been helped by improvements in fuel efficiency and cleaner burning gasoline. But, it is very difficult to point to any one factor as the sole reason that Anchorage's air quality has improved. It is a combination of factors that has created this improvement, and eliminating any one component greatly increases the likelihood that air quality will deteriorate in the future. The system that is in place works well and continues to provide Anchorage with acceptable air quality. Scrapping the IM program, with its proven success, is not the answer to continued improvement in air quality in Anchorage."

Record of Consideration and Use of Written Comments: Since this comment was received after the end of the public comment period and is similar in scope to other comments, no action was taken on this comment.

Fairbanks North Star Borough Assembly
Resolution #2007-46

By: Mayor Jim Whitaker
Introduced: 10/25/07
Adopted: 10/25/07

FAIRBANKS NORTH STAR BOROUGH

RESOLUTION NO. 2007 - 46

A RESOLUTION TO ADOPT THE FAIRBANKS NORTH STAR BOROUGH AIR QUALITY CONTROL PLAN

WHEREAS, The Fairbanks North Star Borough (FNSB) has not had a violation of the National Ambient Air Quality Standard (NAAQS) for Carbon Monoxide since November 19, 1999 and has therefore been in Attainment since November 20, 1999; and

WHEREAS, Emissions control strategies, including the Federal requirements for the use of Low Sulfur Fuel in motor vehicles and new vehicle emissions technology, have significantly reduced Carbon Monoxide emissions in the FNSB; and

WHEREAS, It is now possible to model continued attainment through 2015 without the carbon monoxide emissions reduction benefit of the Inspection and Maintenance (I/M) control measure in the FNSB; and

WHEREAS, The FNSB Air Quality Control Plan has been amended incorporating a new emissions inventory for the FNSB with the removal of the I/M carbon monoxide control measure as early as December 31, 2009 and further utilizing this new emissions inventory with Environmental Protection Agency (EPA) approved methodologies in order to demonstrate how the FNSB plans to continue to meet the NAAQS through 2015; and

WHEREAS, This Air Quality Control plan, once approved by the Alaska Department of Environmental Conservation (DEC) and the EPA, will allow conformity for current and future DOT projects; and

WHEREAS, On September 25th the I/M and Air Pollution Control Commission (PCC) voted unanimously to recommend approval of the Air Quality Control plan as drafted; and

WHEREAS, On October 3rd the Fairbanks Metropolitan Area Transportation System (FMATS) Technical Committee approved the Air Quality Control plan as drafted; and

NOW, THEREFORE, BE IT RESOLVED that the Assembly of the Fairbanks North Star Borough approves the Fairbanks North Star Borough Air Quality Control Plan for submission to the DEC and the EPA.

PASSED AND APPROVED THIS 25th DAY OF OCTOBER 2007.

Luke Hopkins
Presiding Officer

ATTEST:

Mona Lisa Drexler, CMC
Municipal Borough Clerk

Ayes: Bartos, Beck, Frank, Musick, Therrien, Hopkins
Noes: None
Excused: Foote, Winters, Rex